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September 9, 2009

Brandon Perkins, Task Monitor United States Environmental Protection Agency 1200 Sixth Avenue, Mail Stop ECL-112 Seattle, Washington 98101

Re: Contract Number: EP-S7-06-02

Technical Direction Document Number: 08-02-0017

Final Tuluksak River Site Inspection Report

Dear Mr. Perkins:

Enclosed please find the Final Site Inspection report for the Tuluksak River site, which is located near Tuluksak, Alaska. This version incorporates EPA comments. If you have any questions regarding this submittal, please call me at (206) 624-9537.

Sincerely,

ECOLOGY AND ENVIRONMENT, INC.

endo E. Castello

Linda Costello

START-3 Project Leader

cc: Mark Woodke, Project Manager, E & E, Seattle, Washington

Final Tuluksak River Site Inspection Report

Tuluksak, Alaska

Technical Direction Document Number: 08-02-0017

September 2009

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

1200 Sixth Avenue, Mail Stop ECL-112 Seattle, Washington 98101

Prepared by:

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BGS below ground surface CFS cubic feet per second

CLP Contract Laboratory Program
CRQL contract-required quantitation limit

DQOs Data Quality Objectives

E & E Ecology and Environment, Inc.

EPA United States Environmental Protection Agency

GPS Global Positioning System IDW investigation-derived waste

MS matrix spike %R percent recovery

PA preliminary assessment
PPE probable point of entry
QA Quality Assurance
QC Quality Control

RPD relative percent difference

SI Site Inspection

SQAP Sampling and Quality Assurance Plan

START Superfund Technical Assessment and Response Team

TAL target analyte list
TDL target distance limit

TM Task Monitor Tuluksak River Tuluksak River

Introduction

Ecology and Environment, Inc., (E & E) was tasked by the United States Environmental Protection Agency (EPA) to provide technical support for completion of a Site Inspection (SI) at the Tuluksak River (Tuluksak River) site near Tuluksak, Alaska. E & E completed SI activities under Technical Direction Document Number 08-02-0017, issued under EPA, Region 10, Superfund Technical Assessment and Response Team (START)-3 contract number EP-S7-06-02.

The specific goals for the Tuluksak River SI, identified by the EPA, are:

- Determine the potential threat to public health or the environment posed by the site,
- Determine the potential for a release of hazardous constituents into the environment, and
- Determine the potential for placement of the site on the National Priorities List.

Completion of the SI included reviewing existing site information, determining regional characteristics, collecting receptor information within the range of site influence, executing a sampling plan, and producing this report. The report is organized as follows:

- Section 1, Introduction Authority for performance of this work, goals for the project, and summary of the report contents;
- Section 2, Site Background Site description, site operations and waste characteristics, and a summary of investigation locations;
- Section 3, Field Activities and Analytical Protocol Summary of the field effort;
- Section 4, Quality Assurance/Quality Control (QA/QC) Summary of the laboratory data;
- Section 5, Analytical Results Reporting and Background Samples –
 Discussion of results-reporting criteria and background sample locations
 and analytical results;
- Section 6, Potential Sources Discussion of site sources, sample locations, and analytical results;
- Section 7, Migration/Exposure Pathways and Targets Discussion of the migration/exposure pathways, sample locations, and analytical results;
- Section 8, Summary and Conclusions Summary of the investigation and discussion of conclusions based on the information gathered during the investigation;



- Section 9, References Alphabetical list of the references cited throughout the text;
- Appendix A, Sample Plan Alteration Form Changes between the approved sample plan and the field event;
- Appendix B, Photographic Documentation Photographs taken during the sampling event and site visit;
- Appendix C, Chain-of-Custody Documentation Forms documenting sample chain-of-custody for the sampling event;
- Appendix D, Global Positioning System (GPS) Coordinates Latitude and longitude coordinates of sample locations; and
- Appendix E, Data Validation Memoranda Laboratory results and quality assurance evaluation for all samples.

Site Background

This section describes the background of the site including location, description, ownership history, operations and source characteristics, and previous investigations, and provides a summary of the site investigation locations.

2.1 Site Location

Site Name:	Tuluksak River
CERCLIS ID Number:	AKN001002722
Site Address:	Tuluksak, Alaska
Latitude:	61° 00' 18.00" North (Nyac townsite)
Longitude:	159° 56' 48.61" West (Nyac townsite)
Borough:	Unorganized
Congressional District:	1
Site Owner:	Calista Corporation
	301 Calista Court, Suite A
	Anchorage, Alaska 99518-3028
	(907) 279-5516
Site Operator:	NYAC Mining Company
	1634 W. 13th Ave.
	Anchorage, AK 99501
Site Contacts:	Jeff Foley, Geologist, and
	June McAtee, Geologist
	Calista Corporation
	301 Calista Court, Suite A
	Anchorage, Alaska 99518-3028
	(907) 279-5516

2.2 Site Description

The Tuluksak River site consists of the Tuluksak River from near its headwaters to its confluence with Granite Creek, and Bear and California creeks as well as their headwaters to their confluences with the Tuluksak River (Figure 2-1). The Fog River is a tributary of the Tuluksak River with a confluence located within 10 miles of the city of Tuluksak. The city of Tuluksak, located at the confluence of the Kuskokwim and Tuluksak rivers, is approximately 35 miles northeast of Bethel, Alaska, near the Bering Sea (Figure 2-1). The Tuluksak River drains approximately 810 square miles. The Nyac townsite lies approximately 70 miles upstream of the city of Tuluksak on the Tuluksak River and is accessible only by aircraft. The upper portion of the Tuluksak River lies in the Kilbuck Mountains, and the lower portion lies in the plain of the Tuluksak and Kuskokwim rivers.



Potential contamination sources near the Tuluksak River include placer mining dredge spoils. Placer mining has been conducted in the upper reaches of the Tuluksak River for over 100 years. Gold was discovered in commercial quantities on Bear Creek by 1908 (Maddren 1915). Additionally, dredging of the Tuluksak River has been conducted. The Tuluksak River is a slow-moving, meandering stream over most of its length, cutting through several tundra areas in its lower section (Collazzi and Maurer 1987).

2.3 Site Ownership History

The Tuluksak River lies within the Yukon Delta National Wildlife Refuge. The Calista Corporation, an Alaska Regional Native Corporation based in Anchorage, Alaska, owns the land where dredging is being conducted. The NYAC Mining Company leases the land for mining purposes.

2.4 Site Operations and Source Characteristics

Gold was first discovered in the Nyac district on Bear Creek, a tributary of the Tuluksak River, near the mouth of Bonanza Creek in 1907 or 1908 and soon after gold was discovered on the Tuluksak River (Mindat.org 2009). Placer mining on Bear Creek was generally performed by simple open-cut, pick-and-shovel methods with small sluice boxes (Maddren 1915). Placer deposits occur with sand, gravel, and rock; they are usually deposited by flowing water or ice and contain metals that were once part of a lode deposit (EPA 1994).

Dredging began on the Tuluksak River in 1936 and for many years the mining in the district, which was mainly on the Tuluksak River, was carried out by the New York-Alaska Company and its successor, the New York-Alaska Gold Dredging Company. The company built a company town, Nyac and an extensive physical plant and community facilities including a hydroelectric power station to power the dredges, the town, and other mining in the district. In 1965, the property was taken over by the Tuluksak Dredging Company and since 1990, the Nyac Mining Company has been actively mining in the area under an agreement with the Calista Native Corporation, which now owns most of the placer claims in the district (Mindat.org 2009). Figure 2-1 includes the locations of dredge spoil piles on Granite Creek and the Tuluksak River.

Parts from a small wood-hulled dredge that had operated on Bear Creek between 1928 and 1935 were used to build a steel-hulled dredge on the Tuluksak River in 1936. In 1937, another steel-hulled dredge was built and began mining. Dredging continued in the 1960's by the New York-Alaska Dredging Company. There has also been extensive mechanized mining using draglines, tractors, and non-floating washing plants over the years along the Tuluksak. As of 2006, the Tuluksak River is marked by dredge tailings a thousand feet or more wide that extend almost continuously from the mouth of California Creek to about five miles below Nyac. In the early 1980's, Tuluksak Dredging and Northland Dredging rebuilt the steel-hulled dredge about 5 miles downstream from Nyac; they operated it for a year or more until they shut down as a result of a water-quality dispute. There is no public record of the production specifically from the Tuluksak River, but the district produced a minimum of 500,000 ounces of gold, all from placers, and a



large part of that came from the Tuluksak River judging on the extent of the tailings. (Mindat.org 2009)

Nine mines and/or prospects and dredge spoils piles were originally identified in the Sampling and Quality Assurance Plan (SQAP) as possible contributors to potential contamination to the Tuluksak River, including the California Creek mine, an unnamed prospect near California Creek; Upper Tuluksak River mine, an unnamed mine on the south side of the Tuluksak River; Tiny Gulch mine, Tuluksak River mine, NYAC Tuluksak River mine, Granite Creek mine, and the Tuluksak River prospect (E & E 2008a). However, once the field team arrived, it became apparent that many of these locations either did not exist, consisted of only a few shovels of soil, or were impossible to locate due to vegetation.

Gold is the primary mineral that is being mined; however, silver has also historically been mined. Due to the mining practices in the area, it is possible that contamination may migrate from the mines and dredge spoils along Bear Creek, California Creek, and the Tuluksak River to the town of Tuluksak.

Placer deposits are mineral-bearing deposits found in weathered residuum and alluvium. Placers are unconsolidated sedimentary deposits; however, depending on the nature of the associated materials, placers may be cemented to varying degrees. Placers occurring within the permafrost are usually frozen solid (EPA 1994).

Gold placer mining consists of three major steps: extraction, beneficiation, and processing. Extraction is defined as removing ore material from a deposit and encompasses all activities prior to beneficiation. Historically, large-scale placer mining operations used hydraulic methods to excavate pay dirt, whereas smallscale methods for extraction of ore material included panning and suction dredging. In hydraulic mining, water under pressure is forced through an adjustable nozzle called a monitor or giant and directed at a bank to excavate gold placer pay streak (the zone where the economic concentration of gold is located) and to transport it to a recovery unit, which is generally a sluice box. The pressurized water jet can also be used to thaw frozen muck and to break up and wash away overburden. Small-scale methods combine extraction and beneficiation steps because the extraction phase of the placer operation is integrated with beneficiation. Panning is a fairly rudimentary gravity separation technique that recovers gold concentrate. It is also a method used by prospectors to evaluate a placer gold deposit to determine whether it can be mined profitably (EPA 1994). Water gravity processing was used to extract the gold from the mined materials on the Tuluksak River (McAtee 2009).

Beneficiation is the operation by which gold particles are separated from the large quantities of alluvial sediments. Beneficiation typically involves three general steps: the first is to remove grossly oversized material from the smaller fraction that contains the gold; the second to concentrate the gold; and the third to separate the fine gold from other fine, heavy metals. Equipment utilized during this operation include bulldozers, front-end loaders, backhoes, dragline or conveyor



belts, sluices, jigs, shaking tables, spiral concentrators, and pinched sluices. (EPA 1994)

Processing operations, which include smelting, generate final, marketable product bullion from the gold concentrate produced in beneficiation. Historically, the most severe impacts associated with placer mining activities have been physical disturbances to stream channels and the addition of large quantities of sediment downstream. This sediment may have contained increased concentrations of heavy metals generated as a result of mining activities (E & E 2008b). No chemical processing is known to have occurred at the site.

Dredge spoils generated during placer mining operations are potential sources of contamination. The spoils generated during mining operations along the Tuluksak River consist primarily of excess surficial material and do not include chemically-treated materials such as tailings that would remain after the extraction process. Dredge spoil piles at least 3 miles long and up to 0.4 miles wide are present along the Tuluksak River upstream from the confluence with Slate Creek (Figure 2-1; Hoare and Cobb 1977). The potential contaminants of concern at the site associated with these operations are target analyte list (TAL) metals, including arsenic, copper, and lead.

2.5 Previous Investigations

A preliminary assessment (PA) was completed by E & E in 2008 for the EPA. The PA was performed to determine the potential for mining contamination to reach the Tuluksak River. A site visit was not conducted for the PA. The report concluded that waste materials from placer mining operations may be migrating from sources and impacting downstream targets, including wetlands and fisheries. (E & E 2008b)

2.6 Summary of SI Investigation Locations

Sampling under the SI was conducted at areas (i.e., targets) that may have been contaminated through the migration of hazardous substances from site sources. The features identified for inspection under the Tuluksak River SI were determined based on interviews with regulatory agencies and a review of background information. These features are discussed below.

Sources

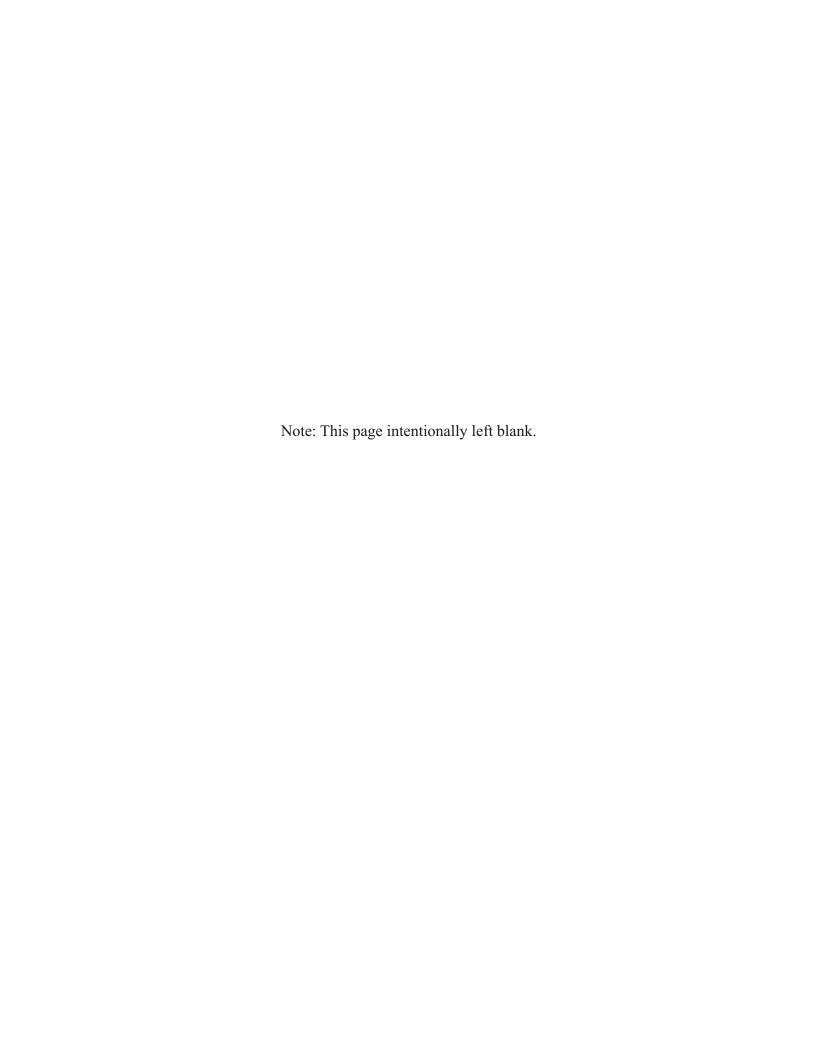
Dredge Spoils, Waste Sand Pile, and Dragline Pile: Dredge spoils and the dragline pile are from placer mining exist along the rivers and may have released TAL metals to surface water. Dredge spoils piles are located along the Tuluksak River and a dragline pile is located along Granite Creek. The waste sand pile was located along Bear Creek. The source of the waste sand pile is unknown. This SI assisted in determining whether hazardous substances are associated with these sources.

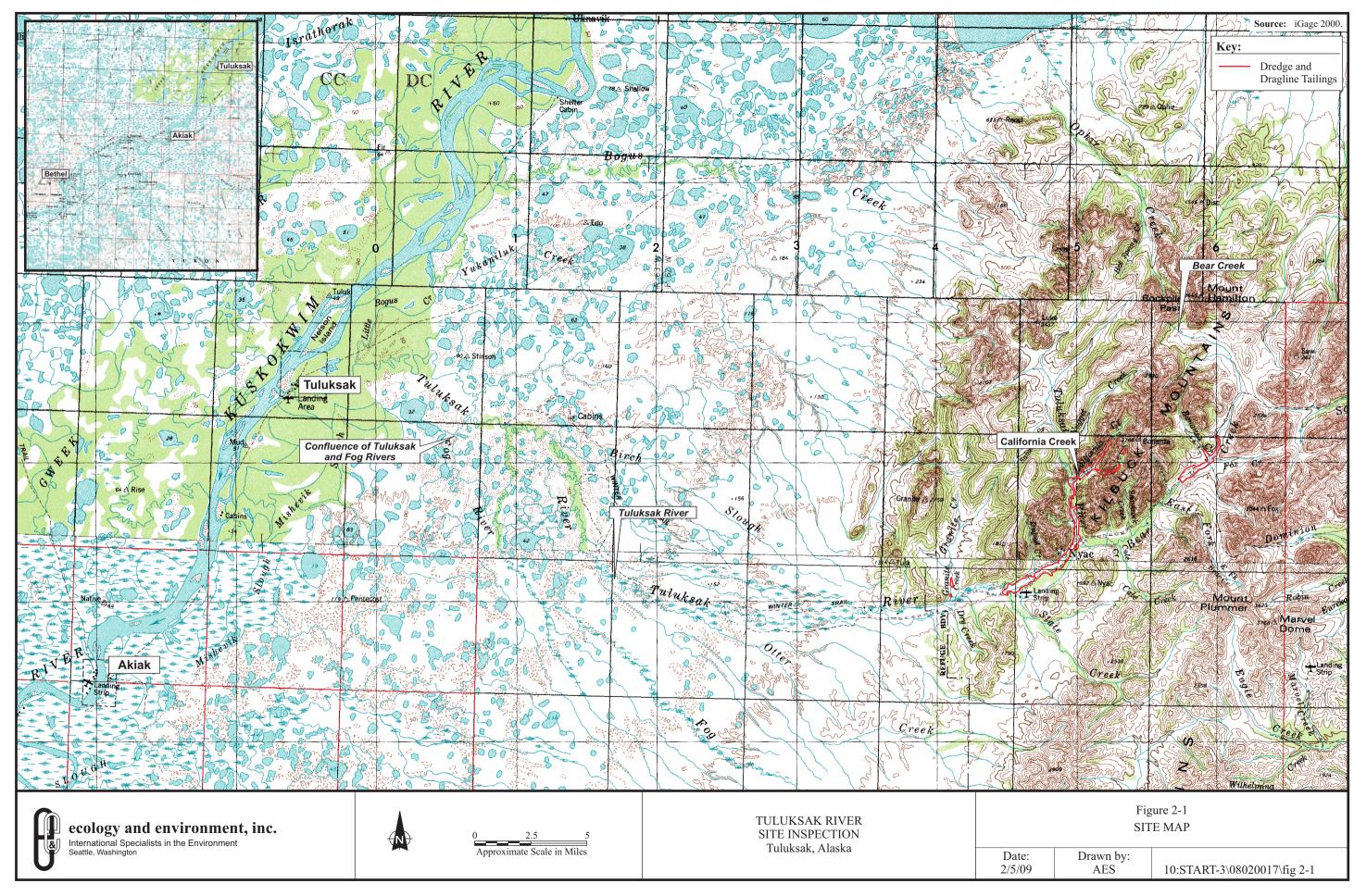
Targets

Surface Water Bodies: Surface water features adjacent to the dredge spoils, including the Tuluksak River and tributaries, may be contaminated as a result of



historical mining activities. This SI assisted in determining whether hazardous substances associated with sources have migrated to surface water bodies.





Field Activities and Analytical Protocol

A SQAP for the Tuluksak River SI was developed by the START prior to field sampling (E & E 2008a). The SQAP describes the sampling strategy, sampling methodology, and analytical program used to investigate potential sources and targets. The SI field activities were conducted in accordance with the approved SQAP and the attached Sample Plan Alteration Forms (Appendix A). Deviations from the SQAP are described, when applicable, in this section and in the sampling location discussions in Section 6 (source areas) and Section 7 (target areas). All deviations to this SQAP were approved by the EPA Task Monitor (TM).

The SI field sampling event was conducted September 16 through 17, 2008. A total of 33 samples, including two background samples, were collected for the SI. Sample types and methods of collection are described below. A list of all samples collected for laboratory analysis under this SI is contained in Table 3-1. Photographic documentation is included in Appendix B.

Alphanumeric identification numbers applied by the START to each sample location (e.g., TR01SD) are used in the report as the sample location identifiers. Table 3-2 provides a key to the sample codes. The sample locations are depicted in Figure 3-1.

This section describes sampling methodology (subsection 3.1), analytical protocol (subsection 3.2), GPS (subsection 3.3), and investigation-derived waste (IDW; subsection 3.4).

3.1 Sampling Methodology

Grass, leaves and other vegetative material, rocks, and other debris unsuitable for analysis were removed from samples before the samples were placed into sample containers. Samples were stored on ice in coolers continuously maintained under the custody of START personnel. Chain-of-custody forms documenting the field samples are included in Appendix C. Sampling methods used for each sample type are described below.

3.1.1 Sediment Sampling

A total of 33 sediment samples, including two background samples, were collected from known areas of sediment deposition. Sediment samples (0 to 6 inches below ground surface [bgs]) were collected using dedicated plastic scoops. The sample material was homogenized in-situ and then placed in certified pre-

3. Field Activities and Analytical Protocol

cleaned, pre-labeled 8-ounce glass jars. Sediment sampling was conducted from the most downstream point and working upstream in order to avoid potential cross-contamination of sample points.

The dredge spoils and dragline pile are materials dredged from the river. Although found at the surface like soil samples, they are actually sediments that have been placed on the surface of the river banks. In the field, the sample matrix was listed as soil; however, the samples are actually sediment. Additionally, the waste sand piles were assigned a matrix code of soil; however, it is suspected they may be processed sediment.

3.2 Analytical Protocol

Table 3-1 presents the analyses applied to each of the samples used for this investigation. A total of 33 samples were submitted to a Contract Laboratory Program (CLP) laboratory, Chemtech Consulting Group of Mountainside, New Jersey, for analysis for TAL metals using EPA Method ILM05.4 (EPA 2007).

3.3 Global Positioning System

GPS points collected on the Tuluksak River were recorded from the readings on the helicopter. GPS points for samples collected from areas around the current mining activities were collected from a hand-held Garmin TM GPS unit. The Trimble Professional unit was not used, as planned in the SQAP, because of poor satellite reception. GPS coordinates are provided as Appendix D.

3.4 Investigation-Derived Waste

IDW generated during the SI sampling effort included disposable personal protective clothing and sampling equipment (i.e., dedicated bowls and spoons). The solid IDW was bagged in opaque plastic garbage bags and disposed of at the local municipal landfill. No liquid IDW was generated during the SI sampling effort. No IDW remains at the site.

Table 3-1 Sample Collection and Analytical Summary

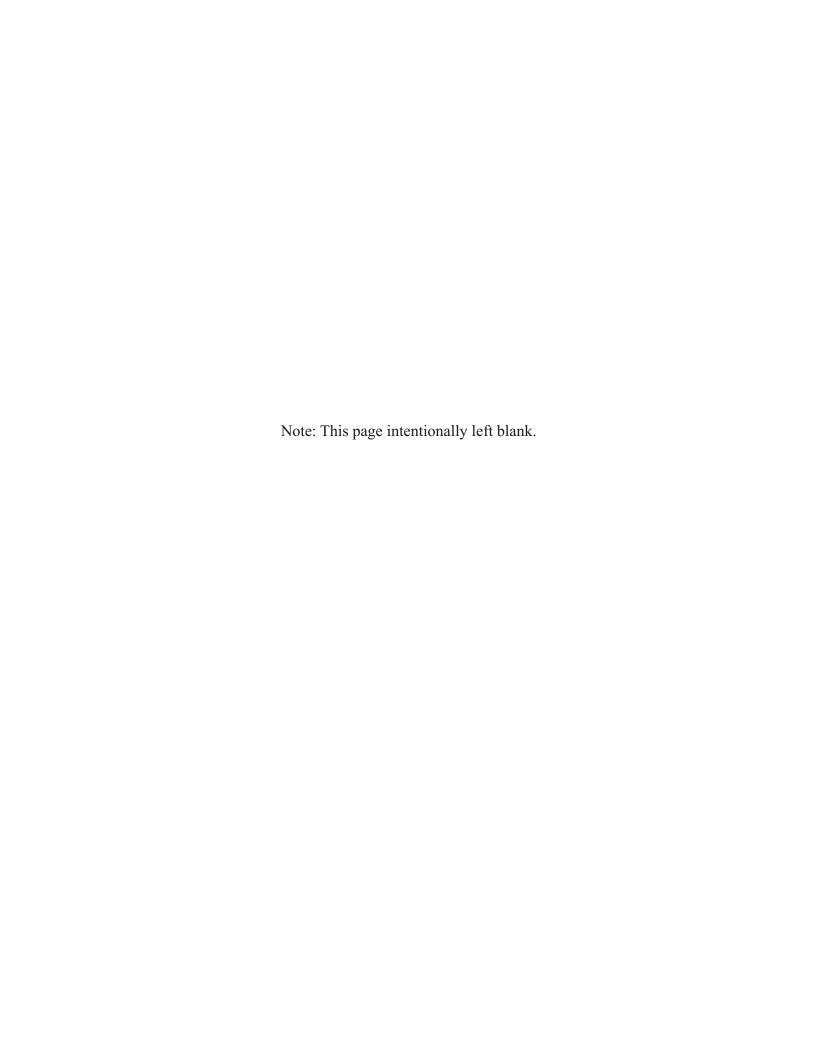
EPA Sample	Station	CLP Sample	Sample C	ollection	1 TAL			
ID .	Location	ID	Date	Time	Metals	Description		
08384200	TR01SD	MJAA55	9/16/2008	1152	X	Tuluksak River. Two miles upstream of Tuluksak Village.		
						Dark gray-green fine silt.		
08384201	TR02SD	MJAA56	9/16/2008	1212	X	Tuluksak River. Dark gray-green silty sand.		
08384202	TR03SD	MJAA57	9/16/2008	1227	X	Tuluksak River. Brown and gray sand.		
08384203	TR04SD	MJAA58	9/16/2008	1245	X	Tuluksak River. Dark gray sand; some organics.		
08384204	TR05SD	MJAA59	9/16/2008	1250	X	Tuluksak River. Thin brown gray silty sand below gray sandy silt.		
08384205	TR06SD	MJAA60	9/16/2008	1305	X	Tuluksak River. Medium brown-gray sandy silt with organics.		
08384206	TR07SD	MJAA61	9/16/2008	1315	X	Tuluksak River. Brown little red sand with small pebbles.		
08384207	TR08SD	MJAA62	9/16/2008	1325	X	Tuluksak River. Brown-gray sand.		
08384208	TR09SD	MJAA63	9/16/2008	1410	X	Tuluksak River. Brown and reddish sand with pebbles.		
08384209	TR10SD	MJAA64	9/16/2008	1420	X	Tuluksak River. Brown sand with organics		
08384210	TR11SD	MJAA65	9/16/2008	1430	X	Tuluksak River. Brown-red sand.		
08384211	TR12SD	MJAA66	9/16/2008	1440	X	Tuluksak River. Brown-red sand with silt layer on top.		
08384212	TR13SD	MJAA67	9/16/2008	1450	X	Tuluksak River. Brown-gray sand with organics.		
08384213	TR14SD	MJAA68	9/16/2008	1500	X	Tuluksak River. Brown-red sand.		
08384214	TR15SD	MJAA69	9/17/2008	0950	X	Tuluksak River. Red-brown sand. Downstream of lowest tailings		
						pile.		
08384215	TR16SD	MJAA70	9/17/2008	1230	X	Tuluksak River. Fine sand, medium brown.		
08384216	TR17SD	MJAA71	9/17/2008	1315	X	Tuluksak River. Red-brown sand. Below California Creek		
						confluence.		
08384217	TR18SD	MJAA72	9/17/2008	1420	X	Tuluksak River. Brown-red coarse sand. Upstream of Tuluksak		
						River mines and downstream of California Creek Mines.		
08384228	FR01SD	MJAA83	9/16/2008	1247	X	Fog River. Brown silty sand top - brown-gray sandy silt.		
08384229	GC01SO	MJAA84	9/16/2008	1630	X	Granite Creek dragline tailings pile. Brown-red sand and gravel.		
08384230	GC02SO	MJAA85	9/16/2008	1633	X	Granite Creek dragline tailings pile. Red-brown pebbles with sand.		
08384231	GC03SO	MJAA86	9/16/2008	1638	X	Granite Creek dragline tailings pile. Red-brown sand and gravel.		
						Some organics.		
08384232	GC04SD	MJAA87	9/16/2008	1645	X	PPE into Granite Creek from dragline tailings pile.		
						Gray pebbles, little sand and organics.		
08384240	TP01SD	MJAA95	9/17/2008	1650	X	Upper Bear Creek Tailings Pond. Light brown silty clay.		
08384241	WS01SO	MJAA96	9/17/2008	1510	X	Waste sand from stockpiles. Medium brown sand with gravel.		
08384242	WS02SO	MJAA97	9/17/2008	1512	X	Waste sand from stockpiles. Medium brown sand with gravel.		
08384243	WS03SO	MJAA98	9/17/2008	1515	X	Waste sand from stockpiles. Medium brown sand with gravel.		
08384261	DS01SO	MJAAB6	9/17/2008	1105	X	Light brown clay with gravel.		
08384262	DS02SO	MJAAB7	9/17/2008	1150	X	Reddish-brown clay.		
08384263	DS03SO	MJAAB8	9/17/2008	1240	X	Reddish-brown clay.		
08384301	BG01SD	MJAAF6	9/16/2008	1615	X	Background and MS/MSD. Granite Creek above dragline tailings		
						piles. Brown layer with sandy silt on top. Brown-red sand.		
08384302	BG02SD	MJAAF7	9/17/2008	1610	X	Background and MS/MSD. Bear Creek above mining areas.		
						Red-brown sand with small pebbles and organics.		
08384303	BC01SD	MJAAF8	9/17/2008	1740	X	Bear Creek. Brown silty sand.		

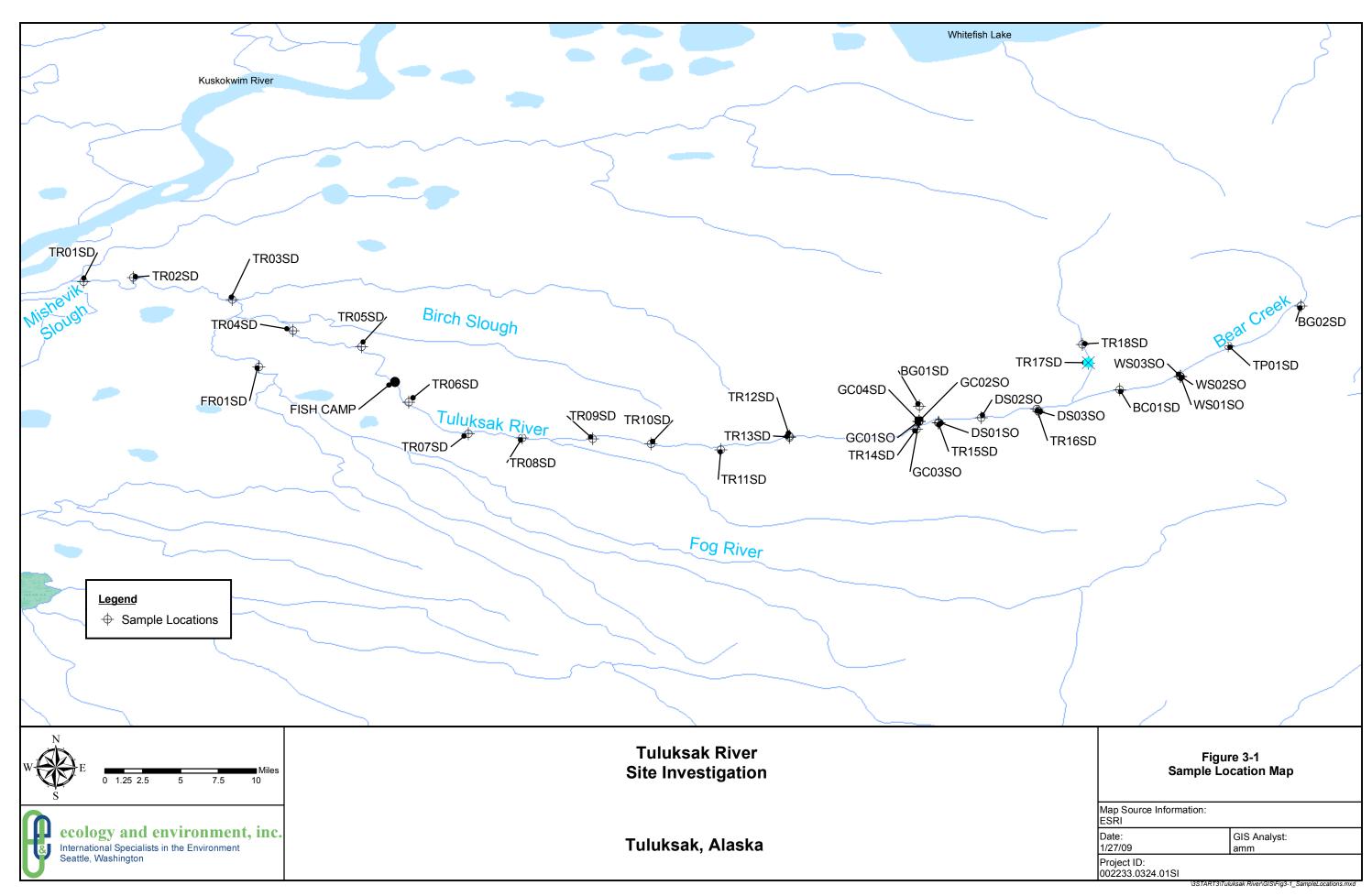
Key:

CLP = Contract Laboratory Program.

EPA = United States Environmental Protection Agency.

ID = Identification.MS = Matrix spike.





Quality Assurance/ Quality Control

QA/QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware, and reagents. Specific QC requirements for laboratory analyses are incorporated in the *Contract Laboratory Program Statement of Work for Inorganic Analyses* (EPA 2007). These QC requirements or equivalent requirements found in the analytical methods were followed for analytical work on the SI. This section describes the QA/QC measures taken for the SI and provides an evaluation of the usability of data presented in this report.

Data from the CLP laboratory were reviewed and validated by an EPA chemist. Data qualifiers were applied as necessary according to *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (2004).

In the absence of other QC guidance, method- and/or standard operating procedure (SOP)-specific QC limits were also utilized to apply qualifiers to the data.

4.1 Satisfaction of Data Quality Objectives

The guidance document used to establish data quality objectives (DQOs) for this SI was *Guidance for the Data Quality Objectives Process* (EPA QA/G-4), EPA/600/R-96/055 (EPA 2000).

The EPA Task Monitor determined that definitive data without error and bias determination would be used for the sampling and analyses conducted during the field activities. The data quality achieved during the field work produced sufficient data that met the DQOs stated in the SQAP (E & E 2008a). A detailed discussion of accomplished SI objectives is presented in the following sections.

4.2 QA/QC Samples

QA samples (trip and rinsate blanks) were not collected. Trip blanks are not required for TAL metals analyses. Rinsate blank samples were not collected because all sample collection equipment was dedicated.

QC samples included matrix spike (MS)/duplicate samples for inorganic analyses at a rate of one MS/duplicate per 20 samples per matrix.



4.3 Project-Specific Data Quality Objectives

The laboratory data were reviewed to ensure that DQOs for the project were met. The following describes the laboratories' abilities to meet project DQOs for precision, accuracy, and completeness and the field team's ability to meet project DQOs for representativeness and comparability. The laboratories and the field team were able to meet DQOs for the project.

4.3.1 Precision

Precision measures the reproducibility of the sampling and analytical methodology. Laboratory and field precision is defined as the relative percent difference (RPD) between duplicate sample analyses. The laboratory duplicate samples measure the precision of the analytical method. The RPD values were reviewed for all laboratory samples. All duplicate RPD values were within QC limits; therefore, the project DQO for precision of 90% was met.

4.3.2 Accuracy

Accuracy measures the strength of the relationship between true values and their predictions. Laboratory accuracy is defined as the MS percent recovery (%R) for all laboratory analyses. The MS %R values were reviewed for all MS analyses. A total of 33 sample results (approximately 4.2% of the data) were qualified as estimated quantities (J or UJ) based on MS outliers; therefore, the project DQO for accuracy of 90% was met.

4.3.3 Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). All laboratory data were reviewed for data validation and usability. No sample results were rejected; therefore, the project DQO for completeness of 90% was met.

4.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. The number and selection of samples were determined in the field to account for site variations and sample matrices. The project DQO for representativeness of 90% was met.

4.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Data produced for this site followed applicable field sampling techniques and specific analytical methodology. The project DQO for comparability of 90% was met.

4.4 Laboratory QA/QC Parameters

The laboratory data also were reviewed for holding times/temperatures, laboratory blank samples, serial dilution analyses, and interference check sample analyses. These QA/QC parameters are summarized below. In general, the laboratory and field QA/QC parameters were considered acceptable.



4.4.1 Holding Times/Temperatures

All samples were analyzed within QC holding time limits and all samples were maintained within QC temperature limits.

4.4.2 Laboratory Blanks

All laboratory blanks met the frequency criteria. No potential contaminants of concern were detected in the laboratory blanks.

4.4.3 Serial Dilution

Serial dilution analyses were performed at a frequency of one per 20 samples per matrix, meeting QC frequency criteria. A total of 72 sample results (approximately 9.1% of the data) were qualified as estimated quantities (J or UJ) based on serial dilution outliers.

4.4.4 Interference Check Samples

Interference check sample analyses were performed at a frequency of one per 20 samples per matrix for TAL metals, meeting QC frequency criteria. All interference check sample results were within QC limits.

Analytical Results Reporting and Background Samples

This section describes the reporting and methods applied to analytical results presented in Sections 6 (sources) and 7 (targets) of this report, and discusses background locations and sample results. Table 3-1 lists all samples collected for laboratory analysis.

5.1 Analytical Results Evaluation Criteria

Analytical results presented in the summary tables of Sections 6 and 7 show all analytes detected above laboratory detection limits in bold type. Analytical results indicating significant concentrations of contaminants in source samples (Section 6) or elevated concentrations of contaminants in target samples (Section 7) with respect to background concentrations are shown underlined and in bold type. For the purposes of this investigation, significant/elevated concentrations are those concentrations that are:

- Equal to or greater than the sample's Contract-Required Quantitation Limit (CRQL); and
- Equal to or greater than the background sample's CRQL when the background concentration was below detection limits; or
- At least three times greater than the background concentration when the background concentration equals or exceeds the detection limits.

The analytical summary tables present all detected compounds, but only those detected analytes at potential sources/targets meeting the significant/elevated concentration criteria are discussed in the report text. All detected concentrations are also discussed for the background samples. When samples were diluted for re-analysis at a laboratory, the dilution results were considered for evaluation and are provided in the tables.

5.1.1 Sample Results Reporting

The analytes aluminum, calcium, iron, magnesium, potassium, and sodium are common earth crust elements. Based on EPA, Region 10 policy, these common earth crust elements will not be discussed in this report.

5.2 Background Samples

Background samples were collected for sediments (Figure 3-1). The background sediment results were also used for comparison with dragline pile, waste sand, and dredge spoil samples as these materials were similar in composition to the sediment samples. Results for the appropriate background samples are shown in

5. Analytical Results Reporting and Background Samples

the first column(s) of the analytical results summary tables in Sections 6 and 7 for comparison with source and target results.

5.2.1 Background/Contribution Sediment Samples5.2.1.1 Sample Locations

The background sediment samples were collected: one on the Tuluksak River (TR18SD), one from Bear Creek (BG02SD), and one above the dredge spoil pile on Granite Creek (BG01SD). These samples were collected above any known mining activity.

A contribution sample was collected from the Fog River. This contribution sample was intended to help determine if this tributary is contributing sediment contamination to the Tuluksak River. This sample (FR01SD) is a contribution sediment sample for samples collected from the Tuluksak River downstream of the confluence with the Fog River.

5.2.1.2 Sample Results

Sample results are presented in Tables 6-1, 6-2, 7-1, 7-2, and 7-3. Sample results for background sediment sample TR18SD indicate the presence of ten TAL metals (arsenic, barium, cadmium, chromium, copper, lead, manganese, nickel, vanadium, and zinc) above the CRQL. Sample results for background sediment sample BG01SD indicate the presence of seven TAL metals (arsenic, barium, chromium, lead, manganese, vanadium, and zinc) above the CRQL. Sample results for background sediment sample BG02SD indicate the presence of nine TAL metals (arsenic, barium, cadmium, chromium, copper, lead, manganese, vanadium, and zinc) above the CRQL. Sample results for the contribution sample FR01SD indicate the presence of 11 TAL metals (arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc) above the CRQL.

Potential Sources

This section describes potential sources, sample locations, and analytical results of SI samples obtained from potential sources. Laboratory data sheets of analytical results for all samples are provided in Appendix E.

The dredge spoils, dragline pile, and possibly waste sand, are materials dredged from the river. Although found at the surface like soil samples, it is suspected that these materials are actually sediments that have been placed on the surface of the river banks. For this reason, results for these samples were compared to the background sediment samples.

6.1 Granite Creek Dragline Pile

A dragline pile located near Granite Creek is approximately 600 feet long by 50 feet wide by an average of 3 feet thick for an approximate volume of 3,333 cubic yards (Figure 2-1). There is no evidence of a maintained engineered cover or a functioning and maintained run-on control system or a runoff management system. TAL metals from this pile may be leaching into Granite Creek and migrating to the Tuluksak River.

6.1.1 Sample Locations

Three samples were collected from the Granite Creek dragline pile area (GC01SO through GC03SO). These samples consisted of brown-red sand with some gravel. Samples were collected between 0 and 6 inches bgs and analyzed for TAL metals.

6.1.2 Sample Results

Sample results are presented in Table 6-1. Sample results indicate that no TAL metals were detected at significant concentrations with respect to background concentrations.

6.2 Waste Sand Piles

Three waste sand piles are located on Bear Creek. The volumes of these piles are estimated to be 11,983,375 cubic yards. The volume was calculated using satellite images and the assumption that the average pile height was 20 feet (Google 2009). There is no evidence of a maintained engineered cover or a functioning and maintained run-on control system or a runoff management system. TAL metals from this pile may be leaching into Bear Creek and migrating to the Tuluksak River.





6.2.1 Sample Locations

Three samples were collected from the waste sand pile area (WS01SO through WS03SO). The materials collected from these piles were primarily medium brown sands and gravel. Samples were collected between 0 and 6 inches bgs and analyzed for TAL metals.

6.2.2 Sample Results

Sample results are presented in Table 6-2. Sample results indicate the presence of a total of three TAL metals (cobalt, copper, and nickel) at significant concentrations with respect to background concentrations. Cobalt and nickel were detected at significant concentrations in all three waste sand pile samples, while copper was detected at a significant concentration only in sample WS01SO.

6.3 Dredge Spoils

Dredge spoil piles are located along the Tuluksak River between the landing strip and California Creek (Figure 2-1). Samples were collected at the locations shown in Figure 3-1. The volumes of these sampled piles are estimated to total 54,545,019 cubic yards. The volumes were calculated using satellite images and the assumption that the average pile heights were 20 feet (Google 2009). TAL metals from these piles may be leaching into the Tuluksak River.

6.3.1 Sample Locations

Three samples were collected from the dredge spoil piles (DS01SO through DS03SO). There is no evidence of a maintained engineered cover or a functioning and maintained run-on control system or a runoff management system. All of the samples contained sand, pebbles, and cobbles. The samples were collected between 0 and 6 inches bgs and analyzed for TAL metals.

6.3.2 Sample Results

Sample results are presented in Table 6-2. Sample results indicate the presence of a total of six TAL metals (cadmium, chromium, cobalt, copper, nickel, and zinc) at significant concentrations with respect to background concentrations. Of these analytes, cobalt, copper, and nickel were detected at significant concentrations in two of the three dredge spoils samples.

6-2

Table 6-1 Granite Creek Dragline Pile Analytical Results Summary					
EPA Sample ID	08384302	08384229	08384230	08384231	
CLP Sample ID	MJAAF7	MJAA84	MJAA85	MJAA86	
Station Location	BG02SD	GC01SO	GC02SO	GC03SO	
Description	Background		Granite Creek		
Target Analyte List	: Metals (mg/kg)				
Aluminum	15400	7670	9250	11000	
Arsenic	15.8	3.9	6.9	19.4	
Barium	161	61.3	31.6	28.2	
Cadmium	1.4	0.48 JQ	1.5	1.2	
Calcium	4580	1400	1730	1520	
Chromium	13.3	5.1	1.6	5.6	
Cobalt	10.1 JQ	5.9	4.3 JQ	5.2 JQ	
	(SQL = 11.7)				
Copper	18.8	10.8	7.8	13.7	
Iron	23900 JL	9770 JL	28100 JL	22200 JL	
Lead	6.5	4.2	13.2	12.9	
Magnesium	4380 JL	2190 JL	2320 JL	4100 JL	
Manganese	1120 JL	149 JL	407 JL	319 JL	
Nickel	8.5 JQ	4.2 JQ	1.3 JQ	5.3	
	(SQL = 9.3)				
Potassium	555 JQ	1500	1500	2130	
Vanadium	51.0	30.9	22.6	18.4	
Zinc	61.5 JL	24.4 JL	62.0 JL	56.2 JL	

Note: Bold type indicates the sample result is above the contract required

quantitation limit or sample quantitation limit.

Underlining indicates the sample result is elevated as defined in Section 5.

Key:

 $CLP = Contract \ Laboratory \ Program.$

EPA = United States Environmental Protection Agency.

ID = Identification.

J = The analyte was positively identified. The associated numerical value is an estimate.

L = Low bias.

mg/kg = Milligrams per kilogram.

 $\label{eq:Q} Q = \mbox{The result is estimated because the concentration is below the contract} \\ \mbox{required quantitation limit or the sample quantitation limit.}$

Table 6-2 Waste Sand and Tuluksak River Dredge Spoils Analytical Results Summary

EPA Sample ID 08384302 08384241 08384242 08384243 08384261 08384262 08384263

Zi / Campio is				00001210			
CLP Sample ID	MJAAF7	MJAA96	MJAA97	MJAA98	MJAAB6	MJAAB7	MJAAB8
Station Location	BG02SD	WS01SO	WS02SO	WS03SO	DS01SO	DS02SO	DS03SO
Description	Background		Waste Sand		[Dredge Spoil	s
Target Analyte List Me	tals (mg/kg)						
Aluminum	15400	17300	19000	18200	29300	3290	40600
Arsenic	15.8	11.9	10.3	8.2	11.9	31.2	1.3 U
Barium	161	88.8	99.8	91.3	229	99.0	369
Beryllium	0.25 JQ	0.31 JQ	0.27 JQ	0.23 JQ	0.72	0.64	0.62 JQ
	(SQL = 1.2)						
Cadmium	1.4	2.1	1.8	1.7	2.1	<u>14.6</u>	2.3
Calcium	4580	2200	2520	2290	3350	1810	17700
Chromium	13.3	18.1	12.3	13.7	6.9	21.3	<u>48.0</u>
Cobalt	10.1 JQ	<u>13.4</u>	<u>14.6</u>	<u>13.9</u>	10.8	<u>22.8</u>	<u>22.8</u>
	(SQL = 11.7)						
Copper	18.8	<u>65.2</u>	51.4	39.6	24.3	<u>202</u>	<u>62.8</u>
Iron	23900 JL	37000 JL	34000 JL	33000 JL	31700 JL	49900 JL	39800 JL
Lead	6.5	10.0	5.2	4.1	9.7	16.0	3.4
Magnesium	4380 JL	9510 JL	11100 JL	10200 JL	11600 JL	758 JL	13700 JL
Manganese	1120 JL	480 JL	514 JL	457 JL	761 JL	2210 JL	874 JL
Nickel	8.5 JQ	<u>11.8</u>	<u>12.1</u>	<u>9.8</u>	5.4	<u>31.0</u>	<u>28.1</u>
	(SQL = 9.3)						
Potassium	555 JQ	527 JQ	534 JQ	495 JQ	10700	823	678
Vanadium	51.0	83.7	79.7	75.3	72.4	69.2	97.7
Zinc	61.5 JL	44.9 JL	45.0 JL	40.8 JL	65.6 JL	<u>1300 JL</u>	41.1 JL

Note: Bold type indicates the sample result is above the contract required quantitation limit or sample quantitation limit.

Underlining indicates the sample result is elevated as defined in Section 5.

Key:

- CLP = Contract Laboratory Program.
- EPA = United States Environmental Protection Agency.
 - ID = Identification.
 - J = The analyte was positively identified. The associated numerical value is an estimate.
 - L = Low bias.
- mg/kg = Milligrams per kilogram.
 - Q = The result is estimated because the concentration is below the contract required quantitation limit or the sample quantitation limit.
 - U = The analyte was not detected at or above the reported limit.

Surface Water Migration Pathway and Targets

The surface water migration pathway target distance limit (TDL) begins at the probable point of entry (PPE) and extends downstream for 15 miles or to the furthest point where elevated concentrations of hazardous substances associated with the sources is documented. Figure 7-1 depicts the surface water migration pathway TDL. The groundwater migration, soil exposure, and air migration pathways were not evaluated per direction of the EPA TM because of a lack of targets for each pathway.

7.1 Overland Pathway

PPE1 for the site is the entire length of the dredge spoils in the Tuluksak River and Bear Creek. PPE2 for the site is the length of the dredge spoils pile between sample locations GC01SO and GC03SO which are located on Granite Creek. PPE3 is at sample location GC04SD at the Granite Creek dragline tailings pile. The TDL begins at the most upstream point where dredge spoils are present in Bear Creek and continues for approximately 62 miles downstream in the Tuluksak River to sample location TR04SD, which is the most downstream point at which elevated concentrations are documented. This sample point is greater than 15 miles downstream of the most downstream source of contamination.

The flow rates of Bear Creek, Granite Creek, and the Tuluksak River are not recorded. It is estimated that the flow rates of Bear Creek and Granite Creek are between 10 and 100 cubic feet per second (cfs). The flow rate for the Tuluksak River is estimated to be greater than 100 cfs, but less than 1,000 cfs.

The 2-year 24-hour rainfall event for the area is 1.5 inches (ENRI UAA 1992). The average annual precipitation for Tuluksak, Alaska, is 66 inches (ADCED 2007). The drainage area for all sources at the site is greater than 100 and less than 1,000 acres (Hanson 2007). The total drainage area of the Tuluksak River is approximately 1,500 square miles (Maddren 1915).

Soils at the site are classified into three different principal components: Histic Pergelic Cryaquepts, Pergelic Cryofibrists, and Typic Cryofluvents (Rieger 1979).

The Histic Pergelic Cryaquepts comprise approximately 55% of the soils and are poorly drained on nearly level to moderate slopes in broad valleys and large basins. The soils developed in nonacid alluvium. Below a thick mat of partly decomposed organic matter, the soils have a mottled gray silt loam horizon that is

7. Surface Water Migration Pathway and Targets

shallow over permafrost. In a few places on the terrains and ground moraines they have a gravely substratum. (Rieger 1979)

The Pergelic Cryofibrists comprise approximately 40% of the soils and are poorly drained organic soils that lie in broad depressions and meander scars, and on the borders of shallow lakes. These soils consist of stratified layers of fibrous moss and sedge peat that is usually very strongly acid. The permafrost table is shallow. (Rieger 1979)

The Typic Cryofluvents comprise approximately 5% of the soils and are deep, well drained silty soils on nearly level natural levees bordering rivers. The soils consist of nonacid to calcareous stratified silty and fine sandy alluvium. In most places they are underlain by very gravelly sand. Permafrost is either deep or absent. (Rieger 1979)

Flood hazard data indicate that flooding occurred in the Tuluksak Village in the 1970s (USACE 1993). Based on this information, the START assumes the site area is within a 100-year flood plain.

7.2 Drinking Water Targets

There are no drinking water intakes located within the TDL. Surface water is not used for the irrigation of five or more acres of commercial food or forage crops, for the watering of commercial livestock, as an ingredient in commercial food preparation, or as a major or designated water recreation area.

7.3 Human Food Chain Targets

No commercial fishing is known to occur along the Tuluksak River (Bue 2007). Tribal members have reported eating fish caught from the Tuluksak River. The primary fishing area along the Tuluksak River is below the confluence with the Fog River approximately 6 miles upstream from the town of Tuluksak (McAtee 2008); however, a fish camp on the Tuluksak River approximately seven miles upstream of the confluence with the Fog River was noted from the helicopter while travelling upstream, therefore, a fishery is located within the TDL In addition to tribal fishing, limited sport fishing occurs on the Tuluksak River. The fish harvest on the Tuluksak River is not recorded by Alaska Department of Fish and Game or by the local tribe (Chythlook 2008). It is not known if fishing occurs on Bear Creek or Granite Creek.

7.4 Environmental Targets

Detailed wetland information is not available for the area therefore wetland frontage was determined during the sampling event. An aerial survey was conducted from the helicopter on September 16, 2008. It was estimated from the field biologist that palustrine emergent and palustrine scrub/shrub wetlands were present on the Tuluksak River from the confluence with the Kuskokwim River to the Tuluksak Mine. This length is longer than the entire TDL; therefore, wetlands are present on both sides of the river for the entire 62 mile TDL. Based on this, there are approximately 124 miles of wetland frontage within the TDL. (Mackey 2009)



The United State Fish and Wildlife Service manages terrestrial threatened and endangered species in the United States. There are no Federal-listed terrestrial threatened or endangered species in the TDL (Balough 2007). The National Oceanic and Atmospheric Administration manages all marine threatened and endangered species in the United States. There are no Federal-listed marine threatened or endangered species in the TDL (NOAA 2009).

7.5 Sample Locations and Results

Sample results are reported from Bear Creek to the confluence with the Tuluksak River and for Granite Creek to the confluence with the Tuluksak River. Sample results on the Tuluksak River are reported by river segments to account for multiple background and contribution samples. From upstream to downstream, the segments are: Upstream of Bear Creek, Bear Creek to Fog River, and from the Fog River to the most downstream sample point. As background and contribution samples are added for comparison to Tuluksak River samples, the highest concentration per analyte was used for evaluation purposes.

7.5.1 Bear Creek

7.5.1.1 Sediment Sample Locations

A total of 2 sediment samples (BC01SD and TP01SD) were collected from Bear Creek, including one sediment sample from an excavated area on the creek

7.5.1.2 Sediment Sample Results

Sample results for the excavated area of Bear Creek and Bear Creek to the confluence with the Tulusak River are provided in Table 7-1. Sample results are compared to the background sample collected from Bear Creek (BG02SD). Three TAL metals (cobalt, copper, and nickel) were detected at elevated concentrations with respect to background concentrations. Cobalt and nickel were detected at elevated concentrations in both samples.

7.5.2 Granite Creek

7.5.2.1 Sediment Sample Locations

One sediment sample was collected from Granite Creek (GC04SD) near the confluence of the creek with the Tuluksak River.

7.5.2.2 Sediment Sample Results

Sample results for Granite Creek are provided in Table 7-2. Sample results are compared to the background sample collected from Bear Creek (BG01SD). Six TAL metals (arsenic, cadmium, chromium, cobalt, copper, and nickel) were detected at elevated concentrations with respect to background concentrations.

7.5.3 Tuluksak River above the Confluence with Bear Creek 7.5.3.1 Sediment Sample Locations

A total of 1 sediment sample was collected above the confluence with Bear Creek on the Tuluksak River (TR17SD).



7.5.3.2 Sediment Sample Results

Sample results for the Tuluksak River to the confluence with Bear Creek are provided in Table 7-3. Sample results are compared to the background sample collected from the Tuluksak River (TR18SD). One TAL metal (cobalt) was detected at elevated concentrations with respect to background concentrations.

7.5.4 Tuluksak River above the Confluence with the Fog River 7.5.4.1 Sediment Sample Locations

A total of 13 sediment samples were collected on the Tuluksak River between the confluence with Bear Creek and the confluence with the Fog River (TR04SD through TR16SD).

7.5.4.2 Sediment Sample Results

Sample results for the samples collected below the confluence with Bear Creek and above the confluence with the Fog River are provided in Table 7-4. The samples from this segment are compared to the background samples collected from Bear Creek (BG02SD) and the Tuluksak River (TR18SD). The highest detection for each analyte from both samples is used as the background sample concentration. Sample results indicated the presence of cobalt at elevated concentrations with respect to background concentrations in five samples (TR04SD, TR06SD, TR12SD, TR13SD, and TR16SD) and nickel at elevated concentrations with respect to background concentrations in five samples (TR04SD, TR06SD, TR07SD, TR08SD, and TR16SD).

7.5.5 Tuluksak River below the Confluence with the Fog River 7.5.5.1 Sediment Sample Locations

A total of 3 sediment samples were collected below the confluence with the Fog River on the Tuluksak River (TR01SD through TR03SD).

7.5.5.2 Sediment Sample Results

Sample results for samples collected from the Tuluksak River below the confluence with the Fog River are provided in Table 7-5. The samples from this segment are compared to the background samples collected from the Tuluksak River (TR18SD) and Bear Creek (BG02SD) and the contribution sample collected from the Fog River (FR01SD). The highest detection for each analyte from all three samples is used as the background sample concentration. Sample results indicated no analytes at elevated concentrations with respect to background concentrations.

Table 7-1 Bear Creek Sediment Samples Analytical Results Summary

EPA Sample ID	08384302	08384240	08384303
CLP Sample ID	MJAAF7	MJAA95	MJAAF8
Station Location	BG02SD	TP01SD	BC01SD
Description	Background	Bear	Creek
Target Analyte List Meta	ls (mg/kg)		
Aluminum	15400	33000	21100
Arsenic	15.8	17.1	19.2
Barium	161	273	167
Cadmium	1.4	2.5	1.7
Calcium	4580	6690	4700
Chromium	13.3	21.5	24.9
Cobalt	10.1 JQ	<u>22.0</u>	<u>15.2</u>
	(11.7 SQL)		
Copper	18.8	<u>63.4</u>	25.5
Iron	23900 JL	41800 JL	33800 JL
Lead	6.5	14.4	7.2
Magnesium	4380 JL	10500 JL	7870 JL
Manganese	1120 JL	987 JL	687 JL
Nickel	8.5 JQ	<u>16.6</u>	<u>24.2</u>
	(9.3 SQL)		
Potassium	555 JQ	1870	888 JQ
Vanadium	51.0	120	70.5
Zinc	61.5 JL	98.5 JL	79.6 JL

Note:

Bold type indicates the result is above the sample quantitation limit.

Underline type indicates the sample result is elevated as defined in Section 5.

Key:

CLP = Contract Laboratory Program.

EPA = United States Environmental Protection Agency.

ID = Identification.

J = The analyte was positively identified. The associated numerical value is an estimate.

L = Low bias.

mg/kg = milligrams per kilogram.

Q = The result is estimated because the concentration is below the contract required quantitation limit.

SQL = Sample Quantitation Limit.

Table 7-2 Granite Creek Sediment Samples Analytical Results Summary

EPA Sample ID	08384301	08384232
CLP Sample ID	MJAAF6	MJAA87
Station Location	BG01SD	GC04SD
	Granite Creek	
Description	Background	Granite Creek
Target Analyte List Met	als (mg/kg)	
Aluminum	3820	11700
Arsenic	1.4	<u>5.2</u>
Barium	66.2	48.2
Cadmium	0.57 JQ	1.2
	(0.61 SQL)	
Calcium	1080	2310
Chromium	3.4	<u>17.8</u>
Cobalt	4.2 JQ	<u>9.7</u>
	(6.1 SQL)	
Copper	2.3 JQ	<u>18.6</u>
	(3.1 SQL)	
Iron	12000	23400 JL
Lead	2.3	5.7
Magnesium	2030	5570 JL
Manganese	255	293 JL
Nickel	2.5 JQ	<u>14.2</u>
	(4.9 SQL)	
Potassium	634	823
Vanadium	21.1	50.4
Zinc	19.8 JL	52.4 JL

Note:

Bold type indicates the result is above the sample quantitation limit.

Underline type indicates the sample result is elevated as defined in Section 5.

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ID = Identification.

J= The analyte was positively identified. The associated numerical value is an estimate.

L = Low bias.

mg/kg = milligrams per kilogram.

Q = The result is estimated because the concentration is below the contract required quantitation limit.

SQL = Sample Quantitation Limit.

Table 7-3 Tuluksak River Sediment Sample Analytical Results Summary (Above Bear Creek Confluence)

EPA Sample ID	08384217	08384216						
CLP Sample ID	MJAA72	MJAA71						
Station Location	TR18SD	TR17SD						
Description	Background	Tuluksak River						
Target Analyte List Metal	Target Analyte List Metals (mg/kg)							
Aluminum	5050	7190						
Arsenic	4.5	6.7						
Barium	72.4	91.3						
Cadmium	0.69	0.79						
Calcium	1630	2140						
Chromium	9.8	11.6						
Cobalt	5.8 JQ	<u>7.9</u>						
	(6.1 SQL)							
Copper	5.0	8.0						
Iron	13500	15400						
Lead	3.1	3.4						
Magnesium	2770	3960						
Manganese	322	402						
Nickel	6.4	8.2						
Potassium	749	996						
Vanadium	29.7	36.2						
Zinc	25.8 JL	35 JL						

Note:

Bold type indicates the result is above the sample quantitation limit.

Underline type indicates the sample result is elevated as defined in Section 5.

Key:

CLP = Contract Laboratory Program.

EPA = United States Environmental Protection Agency.

ID = Identification.

J= The analyte was positively identified. The associated numerical value is an estimate.

L = Low bias.

mg/kg = milligrams per kilogram.

Q = The result is estimated because the concentration is below the contract required quantitation limit.

SQL = Sample Quantitation Limit.

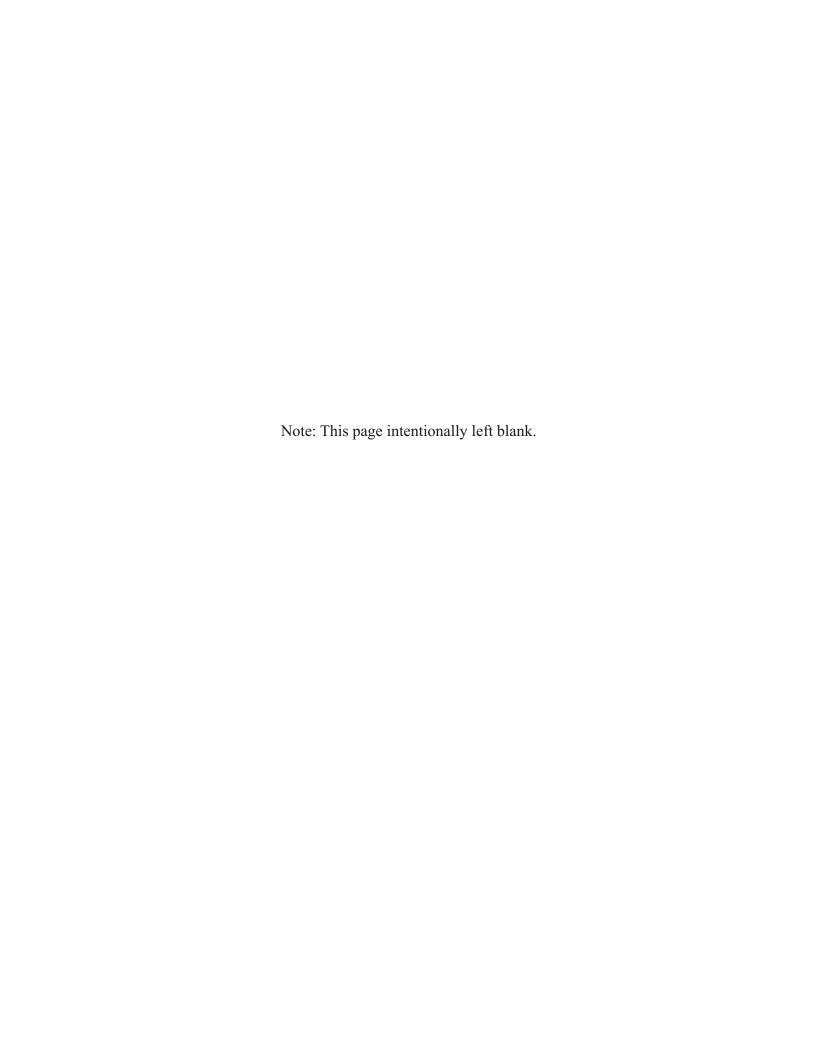


Table 7-4 Tuluksak River Sediment Samples Analytical Results Summary (Between Bear Creek and Fog River Confluences)

EPA Sample ID	08384302	08384217	08384215	08384214	08384213	08384212	08384211	08384210	08384209	08384208	08384207	08384206	08384205	08384204	08384203
CLP Sample ID	MJAAF7	MJAA72	MJAA70	MJAA69	MJAA68	MJAA67	MJAA66	MJAA65	MJAA64	MJAA63	MJAA62	MJAA61	MJAA60	MJAA59	MJAA58
Station Location	BG02SD	TR18SD	TR16SD	TR15SD	TR14SD	TR13SD	TR12SD	TR11SD	TR10SD	TR09SD	TR08SD	TR07SD	TR06SD	TR05SD	TR04SD
Description	Backg	round						1	uluksak Rive	r					
Target Analyte List	Metals (mg/kg))													
Aluminum	15400	5050	19800	13500	13000	17700	15500	11200	13200	11400	13900	13300	16300	13700	18400
Arsenic	15.8	4.5	23.1	11.8	15.1	12.7	14.2	8.4	10.5	7.3	8.7	7.3	8.7	13.6	17.8
Barium	161	72.4	152	103	87.1	135	121	76.1	98.5	62.7	85.8	76.4	104	134	161
Cadmium	1.4	0.69	1.9	1.4	1.4	1.6	1.6	1.1	1.4	1.2	1.5	1.5	1.8	1.8	2.2
Calcium	4580	1630	4340	2620	3000	4190	3720	2510	2720	2230	2420	2390	3040	2880	3500
Chromium	13.3	9.8	25.9	17.3	17.6	19.8	18.7	14.2	16.4	15.8	20.3	21.2	26.1	18.8	25.1
Cobalt	10.1 JQ	5.8 JQ	<u>17.0</u>	10.4	11.2	<u>13.5</u>	<u>13.5</u>	8.6	10.8	9.3	10.9	10.9	<u>11.8</u>	9.4	<u>12.3</u>
	(11.7 SQL)	(6.1 SQL)													
Copper	18.8	5.0	27.0	23.4	24.1	24.9	24.1	16.1	17.7	17.4	18.3	16.7	18.5	17.0	23.3
Iron	23900 JL	13500	35600	27200	26800	29300	30400	21200	25100	23500	27100	27700	33400	34100	39300
Lead	6.5	3.1	6.0	4.7	5.2	7.0	5.6	3.8	4.2	3.8	4.6	4.4	6.0	5.9	8.4
Magnesium	4380 JL	2770	9710	7930	6770	6550	7680	5360	6370	6100	6600	6450	7010	5060	5850
Manganese	1120 JL	322	670	665	591	637	768	501	505	536	715	537	395	401	519
Nickel	8.5 JQ	6.4	<u>23.6</u>	15.6	15.7	16.3	17.4	12.9	15.7	16.1	20.6	<u>23.0</u>	<u>26.2</u>	16.4	<u>21.6</u>
	(9.3 SQL)														
Potassium	555 JQ	749	1000	875	800	1130	978	616 JQ	757	507 JQ	603 JQ	499 JQ	596 JQ	529 JQ	560 JQ
Vanadium	51.0	29.7	75.6	57.9	54.1	64.4	61.6	43.9	51.1	44.7	50.2	44.7	50.9	45.3	57.3
Zinc	61.5 JL	25.8 JL	75.6 JL	59.8 JL	55.9 JL	59.0 JL	64.3 JL	43.0 JL	51.9 JL	50.0 JL	58.2 JL	61.6 JL	72.0 JL	54.1 JL	72.7 JL

Note:

Bold type indicates the result is above the sample quantitation limit.

Underline type indicates the sample result is elevated as defined in Section 5.

Key:

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EPA = United States Environmental Protection Agency.

ID = Identification.

J = The analyte was positively identified. The associated numerical value is an estimate.

L = Low bias.

mg/kg = milligrams per kilogram.

Q = The result is estimated because the concentration is below the contract required quantitation limit.

SQL = Sample Quantitation Limit.

Table 7-5 Tuluksak River Sediment Samples Analytical Results Summary (Below Fog River Confluence)

EPA Sample ID	08384302	08384217	08384228	08384202	08384201	08384200
CLP Sample ID	MJAAF7	MJAA72	MJAA83	MJAA57	MJAA56	MJAA55
Station Location	BG02SD	TR18SD	FR01SD	TR03SD	TR02SD	TR01SD
			Fog River			
Description	Backg	round	Contribution		Tuluksak River	
Target Analyte List Met	als (mg/kg)					
Aluminum	15400	5050	15300	14000	15100	13400
Arsenic	15.8	4.5	17.6	12.3	27.0	28.1
Barium	161	72.4	150	94.7	165	163
Cadmium	1.4	0.69	2.0	1.9	2.7	2.3
Calcium	4580	1630	3840	2900	3780	2890
Chromium	13.3	9.8	25.3	26.3	26.5	22.4
Cobalt	10.1 JQ	5.8 JQ	10.6	15.1	11.4	10.6
	(11.7 SQL)	(6.1 SQL)				
Copper	18.8	5.0	24.8	26.4	21.2	22.1
Iron	23900 JL	13500	37900	32600	46300	41300
Lead	6.5	3.1	8.7	7.1	7.6	8.2
Magnesium	4380 JL	2770	4580	6490	5170	4030
Manganese	1120 JL	322	583	939	443	575
Mercury	0.23 U	0.12 U	0.12 JQ	0.12 U	0.20 U	0.20
			(0.21 SQL)			
Nickel	8.5 JQ	6.4	25.7	32.2	26.5	21.4
	(9.3 SQL)					
Potassium	555 JQ	749	566 JQ	578 JQ	660 JQ	585 JQ
Vanadium	51.0	29.7	42.5	50.1	45.4	40.5
Zinc	61.5 JL	25.8 JL	72.7 JL	77.6 JL	77.9 JL	70.9 JL

Note:

Bold type indicates the result is above the sample quantitation limit.

Underline type indicates the sample result is elevated as defined in Section 5.

Key:

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EPA = United States Environmental Protection Agency.

ID = Identification.

J = The analyte was positively identified. The associated numerical value is an estimate.

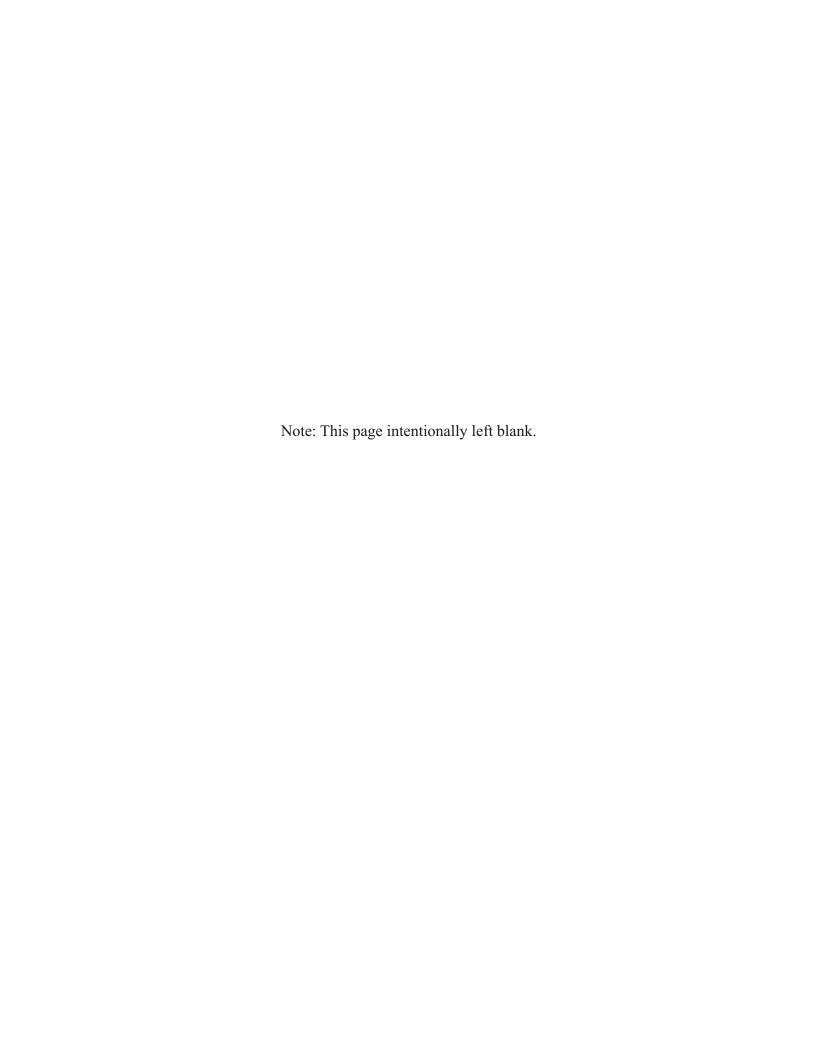
L = Low bias.

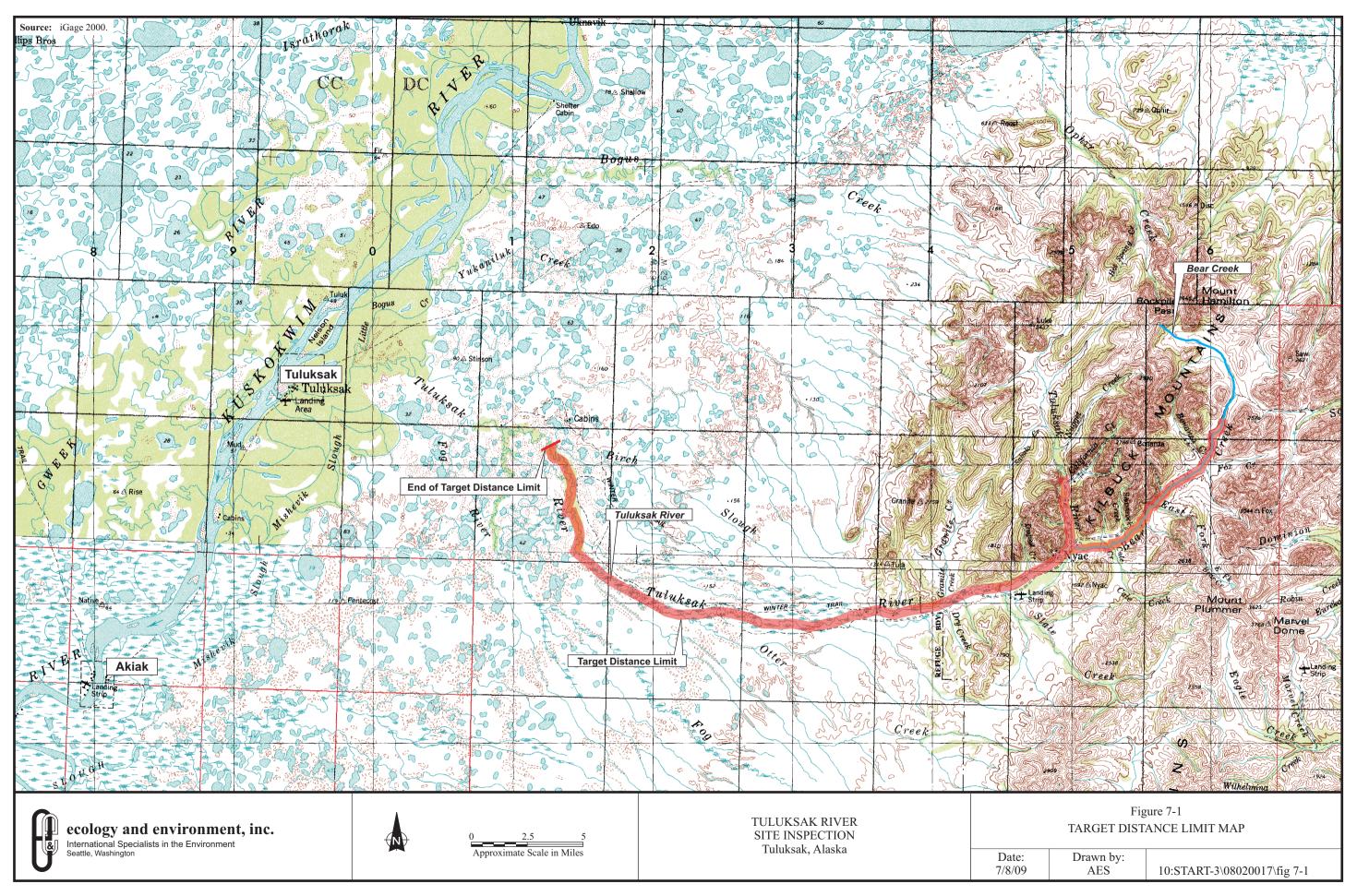
mg/kg = milligrams per kilogram.

Q = The result is estimated because the concentration is below the contract required quantitation limit.

SQL = Sample Quantitation Limit.

U = The analyte was not detected at or above the reported limit.





8

Summary and Conclusions

In September 2008, the START conducted a field sampling event at the Tuluksak River site located near Tuluksak, Alaska. The city of Tuluksak is located at the confluence of the Kuskokwim and Tuluksak rivers. The Nyac townsite lies approximately 70 miles upstream of the city of Tuluksak on the Tuluksak River. Placer mining has been conducted at a number of locations in the upper reaches of the Tuluksak River for over 100 years. Additionally, dredging of the Tuluksak River has been conducted. Dredging and mining created an estimated volume of greater than 65,000,000 cubic yards of dredge spoil, dragline pile, and waste sand materials. The START collected 33 sediment samples during the two-day field event at various locations along Bear Creek, Granite Creek, and the Tuluksak River.

8.1 Sources

Sources associated with placer mining activities in the Tuluksak River include the Granite Creek dragline pile, three waste sand piles, and the dredge spoils piles on the Tuluksak River (Figure 2-1). A total of nine samples were collected from the sources, three from each location. Three TAL metals (cobalt, copper and nickel) were detected at significant concentrations in the waste sand pile samples, no TAL metals were detected at elevated concentrations in the dragline pile, and six TAL metals (cadmium, chromium, cobalt, copper, nickel, and zinc) were detected at significant concentrations in the dredge spoils piles samples. Based on analytical results, two of these sources appear to contain hazardous substances at significant concentrations.

8.2 Targets

There are no drinking water intakes located within the TDL. Surface water is not used as a water supply for more than five acres of commercial food crops, in commercial food preparation, or to water livestock.

No commercial fishing is known to occur along the Tuluksak River. Tribal members have reported eating fish caught from the Tuluksak River and the primary fishing area along the Tuluksak River is below the confluence with the Fog River; however, a fish camp was located within the TDL above the confluence with the Fog River, therefore a fishery is located within the influence of the site. Fish harvesting on the Tuluksak River is not recorded and limited sport fishing occurs.



Detailed wetland information is not available for the area. Observations during the sampling event indicate there are approximately 124 miles of wetland frontage along the TDL. There are no Federal- or State-listed threatened or endangered species within the TDL.

A total of 21 target samples were collected. The TAL metals cobalt, copper, and nickel were detected at elevated concentrations in sediment samples from the excavated area on Bear Creek. The TAL metal cobalt was detected at elevated concentrations in the Tuluksak River sediment sample collected above the confluence with Bear Creek. The TAL metals arsenic, cadmium, chromium, cobalt, copper, and nickel were detected at elevated concentrations in Granite Creek. The TAL metals cobalt and nickel were detected at elevated concentrations in the Tuluksak River sediment samples collected between the confluences of Bear Creek and the Fog River. No TAL metals were detected at elevated concentrations in the Tuluksak River sediment samples collected below the confluence with the Fog River.

8.3 Conclusions

Based on the results of the SI field sampling event, it appears that hazardous substances are migrating from sources to surface water targets. The TAL metals cobalt, copper, and nickel were detected at significant concentrations in the waste sand piles and the dredge spoils piles; and also were detected at elevated concentrations in the samples from Bear Creek and Granite Creek. Cobalt and nickel were detected at elevated concentrations in the Tuluksak River. Contaminated sediments are present from sample location TP01SD on Bear Creek downstream on the Tuluksak River to sample location TR04SD near the confluence with the Fog River. Fisheries and wetlands are present within this zone of contamination.

9

References

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9. References

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Sample Plan Alteration Forms

Project Name and Number: Tuluksak	River						
Technical Direction Document Numb	per 08-02-0017						
Material to be Sampled: Surface soil	Material to be Sampled: Surface soil						
Measurement Parameters: Target ana	alyte list metals						
Standard Procedure for Field Collecti	ion & Laboratory Analysis (cite referen	nces): Not applicable					
Reason for Change in Field Procedure of Analytical Variation: Field conditions were significantly different than those anticipated in the SQAP. The differences in field conditions than those anticipated are partially due to a site visit not being conducted. A site visit was not conducted due to the remote location and the costs associated with two mobilizations. Variation from Field or Analytical Procedure: • Mine Tailings/Waste Rock Piles: A maximum of 27 soil samples were planned but were not collected. Initially, it was thought that up to nine independent mines were present; however, upon arrival at the site it was discovered that the "mines" consisted of only a few shovels full of dirt; therefore, no mine tailings/waste rock pile samples were							
Special Equipment, Materials, or Personnel Required: Not applicable							
CONTACT	APPROVED SIGNATURE	DATE					
Initiator: Renee Nordeen	Rence L'Morden	July 7, 2009					
START PL: Renee Nordeen	Rence Li Mordein	July 7, 2009					

EPA TM: Brandon Perkins

7/13/2009

Project Name and Number: Tuluksak River					
Technical Direction Document Number 08-02-0017					
Material to be Sampled: Surface so	oil and sediment	•			
Measurement Parameters: <u>Target a</u>	analyte list metals				
Standard Procedure for Field Collection	ction & Laboratory Analysis (cite referer	nces): Not applicable			
significantly different than those and than those anticipated are partially	ure of Analytical Variation: Field conditation of the SQAP. The differences due to a site visit not being conducted. As and the costs associated with two mobiles.	in field conditions A site visit was not			
per 2,000 cubic yards of mathan were anticipated were	gs: A maximum of 30 samples were planterial and no more than three samples perencountered; therefore, only six of the 30 ras enacted on September 16 and 17, 200	r pile. Less piles) samples were			
CONTACT	APPROVED SIGNATURE	DATE			
Initiator: Renee Nordeen	Rence Li Mordein	July 7, 2009			
START PL: Renee Nordeen	Rence L'Mordein	July 7, 2009			
EPA TM: Brandon Perkins	Buandon Din	7/13/2009			

Project Name and Number: Tuluksal	Project Name and Number: Tuluksak River				
Technical Direction Document Numb	per 08-02-0017	***************************************			
Material to be Campled: Sediment					
Material to be Sampled: <u>Sediment</u>	· · · · · · · · · · · · · · · · · · ·				
Measurement Parameters: Target ana	alyte list metals				
_					
Standard Procedure for Field Collection	on & Laboratory Analysis (cite referen	nces): Not applicable			
Reason for Change in Field Procedure of Analytical Variation: Field conditions were significantly different than those anticipated in the SQAP. The differences in field conditions than those anticipated are partially due to a site visit not being conducted. A site visit was not conducted due to the remote location and the costs associated with two mobilizations. Variation from Field or Analytical Procedure: • PPE Samples: A maximum of 19 PPE sediment samples were planned but only one was collected on Granite Creek near the dragline tailings pile. The PPEs were anticipated to be collected for each of the individual mines; however, upon arrival at the site, it was discovered that the "mines" consisted of only a few shovels of dirt; therefore, there were not 19 PPEs at the site. This change was enacted on September 17, 2008. Special Equipment, Materials, or Personnel Required: Not applicable					
CONTACT	APPROVED SIGNATURE	DATE			
Initiator: Renee Nordeen	Rence L'Norder	July 7, 2009			
START PL: Renee Nordeen	Rence L'Mordein	July 7, 2009			

EPA TM: Brandon Perkins

Buardon Pei

7/13/2009

EPA QA Officer: Gina Grepo-Grove Beinany Plewe for BURLINE

7/27/09

Project Name and Number: Tuluksak River					
Technical Direction Document Numb	per 08-02-0017				
	·				
Material to be Sampled: Sediment					
Measurement Parameters: Target and	alyte list metals				
Standard Procedure for Field Collecti	on & Laboratory Analysis (cite referen	ices): Not applicable			
Dance for Change in Fig. 1 December	C A 1-4' 1 \$7 (-4' T) - 1 d 4'4				
•	e of Analytical Variation: Field condition of the SQAP. The differences in the SQAP.				
than those anticipated are partially du	e to a site visit not being conducted. A	A site visit was not			
conducted due to the remote location	and the costs associated with two mob	ilizations.			
Variation from Field or Analytical Pr	ocedure:				
• Streams: A maximum of 25 s	samples were planned based on a visua	l survey of the			
topographic maps of the area.	Samples were collected from each po	int that was			
	ery 2 miles for the lower river) and when the pper portion of the river. A total of 21				
	his alteration was enacted on September				
Special Equipment, Materials, or Personal Equipment, Materials,	sonnel Required: Not applicable				
CONTACT	APPROVED SIGNATURE	DATE			
Initiator: Renee Nordeen	(1) (C)	July 7, 2009			
	Kense Li Nordein				
CTAPT DI . D N		Il., 7, 2000			
START PL: Renee Nordeen	"Renee L'Mordein	July 7, 2009			
	`	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
EPA TM: Brandon Perkins	Brandon Di	7/13/2009			

Project Name and Number: Tuluksal	k River				
Technical Direction Document Numb	per 08-02-0017				
Material to be Sampled: Sediment					
Measurement Parameters: Target ana	alyte list metals				
		,			
Standard Procedure for Field Collecti	on & Laboratory Analysis (cite referen	nces): Not applicable			
Reason for Change in Field Procedure	e of Analytical Variation: Field condit	ions were			
	cipated in the SOAP. The differences in				
	e to a site visit not being conducted. A and the costs associated with two mob				
conducted due to the remote rocuren	and the costs associated with two moo	HIZUROIIS.			
Variation from Field or Analytical Pro-	ocedure:				
Background Sediment: A max	ximum of seven sediment samples wer	e planned.			
California Creek above minin	g activities could not be accessed; there	efore, no sample was			
	ground samples were planned to be colon arrival at the site, it was discovered				
	dirt; therefore, there was no need to col				
samples since there were no se	ources samples collected. This alterati				
September 16 and 17, 2008.					
Special Equipment, Materials, or Pers	sonnel Required: Not applicable				
CONTACT	APPROVED SIGNATURE	DATE			
CONTACT	AFFRO VED SIGNATORE	DAIL			
Initiator: Renee Nordeen	Danie Vinandana	July 7, 2009			
,	Kence L'Morder				
START PL: Renee Nordeen		July 7, 2009			
START I.E. Rence Hordeen	Renee L'Mordein	July 7, 2007			

EPA TM: Brandon Perkins	Bunden Pein	7/13/2009
EPA QA Officer: Gina Grepo-Grove Bethann Plewe for	BARLILL	7/27/09

Project Name and Number: Tuluksak River						
Technical Direction Document Num	Technical Direction Document Number 08-02-0017					
Material to be Sampled: <u>Surface so</u>	il					
Measurement Parameters: <u>Target au</u>	nalyte list metals					
Standard Procedure for Field Collec	tion & Laboratory Analysis (cite referen	nces): Not applicable				
significantly different than those anti- than those anticipated are partially d	are of Analytical Variation: Field conditioning the SQAP. The differences have to a site visit not being conducted. An and the costs associated with two mobiles.	in field conditions A site visit was not				
collected for the site, and the	here were no "mines" or tailings/waste to dredge spoil and dragline samples morbil samples were collected. This alteration	e closely resembled				
CONTACT	APPROVED SIGNATURE	DATE				
Initiator: Renee Nordeen	Renee L'Mordein	July 7, 2009				
START PL: Renee Nordeen	Rence L'Mordein	July 7, 2009				
EPA TM: Brandon Perkins	Brounder Rim	7/13/2009				

Project Name and Number: Tuluksak River				
Technical Direction Document Number	per 08-02-0017			
Terror What the Control of the Contr		WWW		
Material to be Sampled: Sediment				
Measurement Parameters: <u>Target and</u>	alyte list metals			
Standard Procedure for Field Collect	ion & Laboratory Analysis (cite referer	aces): Not applicable		
standard Procedure for Pierd Conects	ion & Laboratory Analysis (che referen	ices). <u>Not applicable</u>		
· · · · · · · · · · · · · · · · · · ·	*	The state of the s		
Reason for Change in Field Procedur	e of Analytical Variation: Field condit	ions were		
	cipated in the SOAP. The differences			
	te to a site visit not being conducted. A and the costs associated with two mob			
Variation from Field or Analytical Pr	ooadura	•		
variation from Field of Analytical Fi	ocedure.			
	vere planned for this feature because it pond a sample was collected. This alter			
on September 17, 2008.	pond a sample was conected. This and	ration was enacted		
Special Equipment, Materials, or Per	sonnel Required: Not applicable			
Special Equipment, Waterials, of Ter	sonner Required. Ivot applicable			
CONTACT	ADDDOVED SIGNATURE	DATE		
CONTACT	APPROVED SIGNATURE	DATE		
Initiator: Renee Nordeen	Renee L'Mordein	July 7, 2009		
	firmed to become			
START PL: Renee Nordeen	(D) (C)	July 7, 2009		
	Kence L'Mordeur			
EDA TM. Drondon Dodding	2 1 2 .			
EPA TM: Brandon Perkins	Buanden Din	7/13/2009		
EPA QA Officer: Gina Grepo-Grove Bethany Plewe for	Ballen	7/27/2009		

Project Name and Number: Tuluksal	k River	· · · · · · · · · · · · · · · · · · ·
Technical Direction Document Number	ber 08-02-0017	
Material to be Sampled: Sediment		
		<u> </u>
Measurement Parameters: Target and	alvte list metals	
	41710 1101 1110 1110	
Standard Procedure for Field Collection	ion & Laboratory Analysis (cite referen	ices): Not applicable
•	e of Analytical Variation: Field condit cipated in the SQAP. The differences in	
than those anticipated are partially du	e to a site visit not being conducted. A	A site visit was not
conducted due to the remote location	and the costs associated with two mob	ilizations.
Variation from Field or Analytical Pr	ocedure:	
	re planned for this feature because it wa	
	one sample from each pile was collecte enacted on September 17, 2008.	ed for a total of three
Special Equipment, Materials, or Pers	•	
Special Equipment, Materials, of Tel	sonner Required. Not applicable	
CONTACT	APPROVED SIGNATURE	DATE
		V 1 7 2000
Initiator: Renee Nordeen	Renee L'Mordein	July 7, 2009
	`	
START PL: Renee Nordeen	Rence Li Mordein	July 7, 2009
	() ()	
EPA TM: Brandon Perkins	Buarder Pin	7/13/2009
EPA QA Officer: Gina Grepo-Grove	RADDIII	7/27/09

Project Name and Number: <u>Tuluksak</u>	River			
Technical Direction Document Number 08-02-0017				
Material to be Sampled: Not applicable				
Measurement Parameters: Global positioning system coordinates.				
Standard Procedure for Field Collection & Laboratory Analysis (cite references): Not applicable				
Reason for Change in Field Procedure of Analytical Variation: <u>Helicopter global positioning</u> system (GPS) readings were used for downstream Tuluksak River sample locations to save time. The Trimble TM Professional GPS unit was not used for areas near current mining activities, as planned in the SQAP, because of poor satellite reception.				
Variation from Field or Analytical Procedure: GPS points collected on the Tuluksak River were recorded from the readings on the helicopter (used to access remote sample locations) instead of using an EPA GPS unit. GPS points for samples collected from areas around the current mining activities were collected from a hand-held Garmin TM GPS unit. This alteration was enacted on September 16 and 17, 2008. Special Equipment, Materials, or Personnel Required: Not applicable				
CONTACT	APPROVED SIGNATURE	DATE		

CONTACT	APPROVED SIGNATURE	DATE
Initiator: Renee Nordeen	Rence L'Morden	July 7, 2009
START PL: Renee Nordeen	Rence L'Mordein	July 7, 2009
EPA TM: Brandon Perkins	Brancher Ri	7/13/2009
EPA QA Officer: Gina Grepo-Grove	Barline	7/27/09



Photographic Documentation

TULUKSAK RIVER Tuluksak, Alaska



Photo 1 Location TR01SD.

Direction: South Date: 9/16/08 Time: 11:55 Taken By: BM

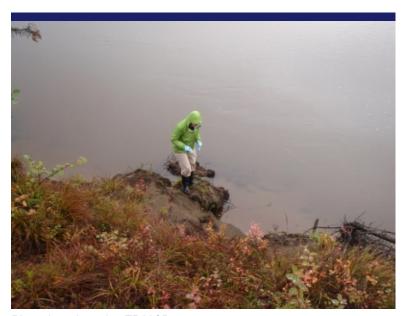


Photo 3 Location TR03SD.

Direction: Northeast Date: 9/16/08 Time: 12:27 Taken By: RN

TDD Number: 08-02-0017 Photographed by: Renee Nordeen (RN), Blythe Mackey (BM)



Photo 2 Location TR02SD.

Direction: Southwest Date: 9/16/08 Time: 12:10 Taken By: BM

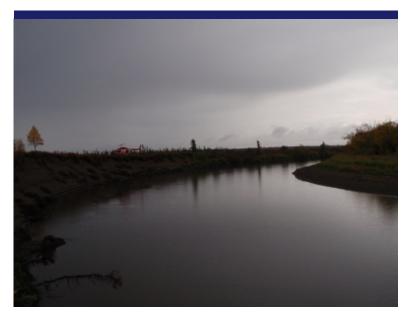


Photo 4 River upgradient of TR03SD.

Direction: Northeast Date: 9/16/08 Time: 12:27 Taken By: RN





Photo 5 Location TR04SD with Fog River in background.

Direction: Northeast Date: 9/16/08 Time: 12:40 Taken By: BM



Photo 7 Location TR05SD.

Direction: Date: 9/16/08 Time: 12:50 Taken By: RN



Photo 6 Location FR01SD with Tuluksak River in background.

Direction: East Date: 9/16/08 Time: 12:47 Taken By: RN



Photo 8 Fish camp with weir.

Direction: Down Date: 9/16/08 Time: 13:00 Taken By: RN

TULUKSAK RIVER Tuluksak, Alaska



Photo 9 Location TR06SD.

Direction: West Date: 9/16/08 Time: 13:05 Taken By: RN

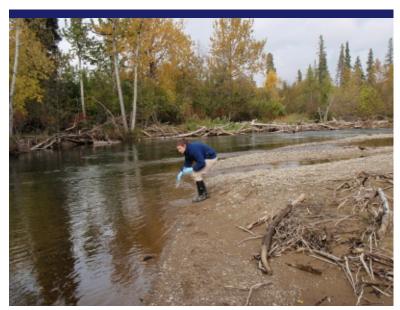


Photo 11 Location TR08SD.

Direction: Date: 9/16/08 Time: 13:25 Taken By: RN

TDD Number: 08-02-0017 Photographed by: Renee Nordeen (RN), Blythe Mackey (BM)

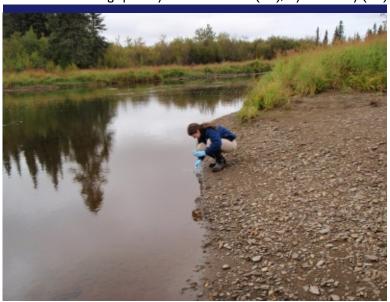


Photo 10 Location TR07SD.

Direction: North Date: 9/16/08 Time: 13:15 Taken By: RN



Photo 12 Location TR09SD.

Direction: Date: 9/16/08 Time: 14:10 Taken By: RN





Photo 13 Location TR10SD.

Direction: Date: 9/16/08 Time: 14:20 Taken By: RN

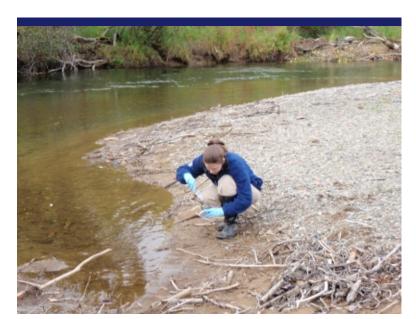


Photo 15 Location TR12SD.

Direction: Date: 9/16/08 Time: 14:40 Taken By: RN



Photo 14 Location TR11SD.

Direction: Date: 9/16/08 Time: 14:30 Taken By: RN



Photo 16 Location TR13SD.

Direction: Date: 9/16/08 Time: 14:50 Taken By: RN

TULUKSAK RIVER Tuluksak, Alaska

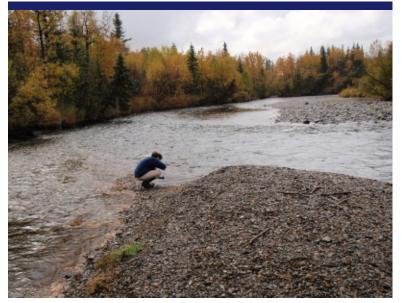


Photo 17 Location TR14SD where two channels meet.

Direction: Date: 9/16/08 Time: 15:00 Taken By: RN



Photo 19 Location GC01SO.

Direction: North Date: 9/16/08 Time: 16:30 Taken By: RN

TDD Number: 08-02-0017 Photographed by: Renee Nordeen (RN), Blythe Mackey (BM)



Photo 18 Location BG01SD on GC.

Direction: Date: 9/16/08 Time: 16:15 Taken By: RN



Photo 20 Location GC02SO.

Direction: Date: 9/16/08 Time: 16:32 Taken By: RN





Photo 21 Location GC03SO.

Direction: Date: 9/16/08 Time: 16:37 Taken By: RN



Photo 23 Location DS01SO.

Direction: Date: 9/17/08 Time: 11:06 Taken By: RN



Photo 22 Location TR15SD.

Direction: Date: 9/17/08 Time: 10:50 Taken By: RN



Photo 24 Location DS02SO.

Direction: Date: 9/17/08 Time: 11:51 Taken By: RN

TULUKSAK RIVER Tuluksak, Alaska



Photo 25 Location TR16SD.

Direction: Date: 9/17/08 Time: 12:25 Taken By: RN



Photo 27 Location TR17SD.

Direction: Date: 9/17/08 Time: 13:18 Taken By: RN

TDD Number: 08-02-0017 Photographed by: Renee Nordeen (RN), Blythe Mackey (BM)



Photo 26 Location DS03SO.

Direction: Date: 9/17/08 Time: 12:43 Taken By: RN



Photo 28 Location TR18SD.

Direction: Date: 9/17/08 Time: 14:11 Taken By: BM

TULUKSAK RIVER Tuluksak, Alaska



Photo 29 Location WS01SO, WS02SO, and WS03SO.

Direction: Date: 9/17/08 Time: 15:20 Taken By: RN



Photo 31 Location BC01SD.

Direction: Date: 9/17/08 Time: 17:33 Taken By: RN

TDD Number: 08-02-0017 Photographed by: Renee Nordeen (RN), Blythe Mackey (BM)



Photo 30 Location BG02SD.

Direction: Date: 9/17/08 Time: 16:18 Taken By: RN



Chain-of-Custody Documentation

Reference Case: 37825

Client No:

R

Region: Project Code:	10 TEC-932A	Date Shipped:	9/22/2008	Chain of Custoo	ly Record	Sampler Signature:	+ //
Account Code:	120-0324	Carrier Name:	FedEx			D	
CERCLIS ID:		Airbill:	8667 8761 3850	Relinquished By	(Date/Time)	Received By	(Date/Time)
Spill ID:	zz	Shipped to:	ChemTech Consulting Group (CHEM)	1RVorde-	9122108/120	ž),	
Site Name / City/State:	Tuluksak River NYAC, AK		284 Sheffield Street Mountainside NJ 07092	2	11241001120		
Project Leader:	Mark Woodke			3			
Action:	Listing Site Inspection			4			
Sampling Co:	Ecology and Environment, Inv.						

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	ΤΎΡΕ	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
MJAA55	Sediment/ Blythe Mackey	G	TM (21)	O8384200 (Ice Only) (1)	TR01SD	S: 09/16/2008 11:52	_
MJAA56	Sediment/ Blythe Mackey	G	TM (21)	08384201 (Ice Only) (1)	TR02SD	S: 09/16/2008 12:12	_
MJAA57	Sediment/ Blythe Mackey	G	TM (21)	08384202 (Ice Only) (1)	TR03SD	S: 09/16/2008 12:27	
MJAA58	Sediment/ Blythe Mackey	G	TM (21)	08384203 (ice Only) (1)	TR04SD	S: 09/16/2008 12:45	_
MJAA59	Sediment/ Blythe Mackey	G	TM (21)	08384204 (Ice Only) (1)	TR05SD	S: 09/16/2008 12:50	· <u></u>
MJAA60	Sediment/ Blythe Mackey	G	TM (21)	08384205 (Ice Only) (1)	TR06SD	S: 09/16/2008 13:05	•••

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
Υ			
Analysis Key:	Concentration: L = Low, M = Medium, H = High, L/M = Low/M	edium Type/Designate : Composite = C, Grab = G, Both = B	Shipment Iced?
TM = CLP TAL Total N	Metals		

COC Number: 10-4097213-092208-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

REGION COPY

Reference Case: 37825 Client No:

R

Region:	10	Date Shipped:	9/22/2008	Chain of Custody	v Record	Sampler	
Project Code:	TEC-932A	Carrier Name:	FedEx		,	Signature:	$1 \Lambda L$
Account Code: CERCLIS ID:		Airbill:	8667 8761 3850	Relinquished By	(Date/Time)	Received By	(Date/Time)
Spill ID:	ZZ.	Shipped to:	ChemTech Consulting Group (CHEM)	1 Rvorde	9122/08/121	-	
Site Name / City/State:	Tuluksak River NYAC, AK		284 Sheffield Street Mountainside NJ 07092	2			
Project Leader:	Mark Woodke			3			
Action:	Listing Site Inspection			4		· · · · · · · · · · · · · · · · · · ·	
Sampling Co:	Ecology and Environment, Inv.						

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
MJAA61	Sediment/ Blythe Mackey	G	TM (21)	08384206 (Ice Only) (1)	TR07SD	S: 09/16/2008 13:15	-
MJAA62	Sediment/ Blythe Mackey	G .	TM (21)	08384207 (Ice Only) (1)	TR08SD	S: 09/16/2008 13:25	_
MJAA63	Sediment/ Blythe Mackey	G	TM (21)	08384208 (Ice Only) (1)	TR09SD	S: 09/16/2008 14:10	Field SampleUJ
MJAA64	Sediment/ Blythe Mackey	G	TM (21)	08384209 (Ice Only) (1)	TR10SD	S: 09/16/2008 14:20	
MJAA65	Sediment/ Blythe Mackey	G	TM (21)	08384210 (Ice Only) (1)	TR11SD	S: 09/16/2008 14:30	_
MJAA66	Sediment/ Blythe Mackey	G	TM (21)	08384211 (Ice Only) (1)	TR12SD	S: 09/16/2008 14:40	

Shipment for Case Complete? Sample (s) to be used for laboratory QC:		Additional Sampler Signature (s):	Chain Of Custody Seal Number :
Y			
Analysis Key:	Concentration: L = Low, M = Medium, H = High, L/M = Low/Me	dium Type/Designate : Composite = C, Grab = G, Both = B	Shipment Iced?
TM = CLP TAL Total N	Metals .		

COC Number: 10-4097213-092208-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

REGION COPY

Reference Case: 37825
Client No:

Region:	10	Date Shipped:	9/22/2008	Chain of Custod	y Record	Sampler	
Project Code:	TEC-932A	Carrier Name:	FedEx		-	Signature	
Account Code:							_ == -
CERCLIS ID:		Airbil(:	8667 8761 3850	Relinquished By	(Date/Time)	Received By /	(Date/Time)
Spill ID:	ZZ	Shipped to:	ChemTech Consulting Group (CHEM)	Rigaria	-9122103/12/	A)	·
Site Name / City/State:	Tuluksak River NYAC, AK		284 Sheffield Street Mountainside NJ 07092	2			
Project Leader:	Mark Woodke			3			
Action:	Listing Site Inspection			4	·		
Sampling Co:	Ecology and Environment, Inv.						
		· · · · · · · · · · · · · · · · · · ·	·····			·	

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
MJAA67	Sediment/ Blythe Mackey	G	TM (21)	08384212 (Ice Only) (1)	TR13SD	S: 09/16/2008 14:50	_
MJAA68	Sediment/ Blythe Mackey	G	TM (21)	08384213 (Ice Only) (1)	TR14SD	S: 09/16/2008 15:00	-
MJAA69	Sediment/ Blythe Mackey	G	TM (21)	08384214 (Ice Only) (1)	TR15SD	S: 09/17/2008 09:50	
MJAA70	Sediment/ Blythe Mackey	G	TM (21)	08384215 (Ice Only) (1)	TR16SD	S: 09/17/2008 12:30	
MJAA71	Sediment/ Blythe Mackey	G	TM (21)	08384216 (ice Only) (1)	TR17SD	S: 09/17/2008 13:15	-
MJAA72	Sediment/ Blythe Mackey	G	TM (21)	08384217 (Ice Only) (1)	TR18SD	S: 09/17/2008 14:20	-

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
Υ			
Analysis Key:	Concentration: L = Low, M = Medium, H = High, L/M = Lo	w/Medium Type/Designate: Composite = C, Grab = G, Both = B	Shipment Iced?
TM = CLP TAL Total N	Matale		

TM = CLP TAL Total Metals

COC Number: 10-4097213-092208-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

REGION COPY

Reference Case: 37825 Client No:

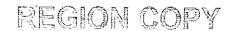
		<u> </u>					
Region:	10	Date Shipped:	9/22/2008	Chain of Custod	ly Record	Sampler	
Project Code:	TEC-932A	Carrier Name:			.,	Signature:	カイ
Account Code:			FedEx			ملي!	
CERCLIS ID:		Airbill:	8667 8761 3850	Relinquished By	(Date/Time)	Received By	(Date/Time)
Spill ID:	ZZ	Shipped to:	ChemTech Consulting Group (CHEM)	Brown	9122/08/12	Dia	
Site Name / City/State:	Tuluksak River		284 Sheffield Street Mountainside NJ 07092	2	- 1122100112	<u> </u>	
-	NYAC, AK				 		
Project Leader:	Mark Woodke	•		3			
Action:	Listing Site Inspection			4		 	
Sampling Co:	Ecology and Environment, Inv.			'			•
	· · · · · · · · · · · · · · · · · · ·			<u> </u>		1	

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
MJAA83	Sediment/ Blythe Mackey	G	TM (21)	08384228 (Ice Only) (1)	FR01SD	S: 09/16/2008 12:47	-
MJAA84	Surface Soil/ Blythe Mackey	G	TM (21)	08384229 (Ice Only) (1)	GC01SO	S: 09/16/2008 16:30	
MJAA85	Surface Soil/ Blythe Mackey	. G	TM (21)	08384230 (Ice Only) (1)	GC02SO	S: 09/16/2008 16:33	-
MJAA86	Surface Soil/ Blythe Mackey	G	TM (21)	08384231 (Ice Only) (1)	GC03SO	S: 09/16/2008 16:38	-
MJAA87	Sediment/ Blythe Mackey	G	TM (21)	08384232 (Ice Only) (1)	GC04SD	S: 09/16/2008 16:45	
MJAA95	Sediment/ Blythe Mackey	G	TM (21)	08384240 (Ice Only) (1)	TP01SD	S: 09/17/2008 16:50	- .

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
Y			
Analysis Key:	Concentration: L = Low, M = Medium, H = High, L/M = Low/Me	dium Type/Designate: Composite = C, Grab = G, Both = B	Shipment Iced?
TM = CLP TAL Total N	letals		

COC Number: 10-4097213-092208-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.



Reference Case: 37825

Client No:

Region:	10	Date Shipped:	9/22/2008	Chain of Custod	y Record	Sampler	, A
Project Code: Account Code:	TEC-932A	Carrier Name:	FedEx		•	Signature:	$\gamma \leftarrow \sim $
CERCLIS ID:		Aîrbîll:	8667 8761 3850	Relinquished By	(Date/Time)	Received By	(Date/Time)
Spill ID:	ZZ	Shipped to:	ChemTech Consulting Group (CHEM)	1 Riconn	9/22/08/120		
Site Name / City/State:	Tuluksak River NYAC, AK		284 Sheffield Street Mountainside NJ 07092	2			
Project Leader:	Mark Woodke			3			
Action:	Listing Site Inspection			4		<u> </u>	
Sampling Co:	Ecology and Environment, Inv.						
				<u> </u>			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
MJAA96	Surface Soil/ Blythe Mackey	G	TM (21)	08384241 (Ice Only) (1)	WSD1SO	S: 09/17/2008 15:10	
MJAA97	Surface Soil/ Blythe Mackey	G	TM (21)	08384242 (Ice Only) (1)	WS02SO	S: 09/17/2008 15:12	-
8eAALM	Surface Soil/ Blythe Mackey	G	TM (21)	08384243 (Ice Only) (1)	WS03SO	S: 09/17/2008 15:15	<u>-</u> -
MJAAB6	Surface Soil/ Blythe Mackey	G	TM (21)	08384261 (Ice Only) (1)	DS01SO	S: 09/17/2008 11:05	-
MJAAB7	Surface Soil/ Blythe Mackey	G	TM (21)	08384262 (Ice Only) (1)	DS02SO	S: 09/17/2008 11:50	
MJAAB8	Surface Soil/ Blythe Mackey	G	TM (21)	08384263 (Ice Only) (1)	DS03SO	S: 09/17/2008 12:40	

Shipment for Case Complete?	Sample (s) to be used for laboratory QC:	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
Y			
Analysis Key:	Concentration: L = Low, M = Medium, H = High, L/M = Low/Med	fium Type/Designate : Composite = C, Grab = G, Both = B	Shipment Iced?
TM = CLP TAL Total N	fetals		

COC Number: 10-4097213-092208-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Reference Case: 37825

Client No:

Region:	10	Date Shipped:	9/22/2008	Chain of Custody	y Record	Sampler	
Project Code:	TEC-932A	Carrier Name:	FedEx			Signature:	KAL
Account Code:				Relinguished By	(D-1-67:)	70 1	2 CS
CERCLIS ID:		Airbill:	8667 8761 3850	Relinquished by	(Date/Time)	Received By	(Date/Time)
Spill ID:	ZZ	Shipped to:	ChemTech Consulting Group (CHEM) 284 Sheffield Street	1/2/oran	9/22/08/12/00		
Site Name / City/State:	Tuluksak River NYAC, AK	:	Mountainside NJ 07092	2			
Project Leader:	Mark Woodke			3			
Action:	Listing Site Inspection			4			
Sampling Co:	Ecology and Environment, Inv.		·				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/Bottles	SAMPLING LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
MJAAF6	Sediment/ Blythe Mackey	G	TM (21)	08384301 (Ice Only) (1)	BG01SD	S: 09/16/2008 16:15	_
MJAAF7	Sediment/ Blythe Mackey	G	TM (21)	08384302 (Ice Only) (1)	BG02SD	S: 09/17/2008 16:10	
MJAAF8	Sediment/ Blythe Mackey	G	TM (21)	08384303 (Ice Only) (1)	BC01SD	S: 09/17/2008 17:40	

Shipment for Case Complete? Y	Sample (s) to be used for laboratory QC: MJAAF6, MJAAF7	Additional Sampler Signature (s):	Chain Of Custody Seal Number :
Analysis Key:	Concentration: L = Low, M = Medium, H = High, L/M = Low/Me	dium Type/Designate : Composite = C, Grab = G, Both = B	Shipment Iced?
TM = CLP TAL Total N	vietals		

COC Number: 10-4097213-092208-0001

· REGION COPY



Global Positioning System Coordinates

GPS Coordinates

EPA Sample	Station	CLP Sample	Latitude	Longitude
ID	Location	ID	(Degrees North)	(Degrees West)
08384200	TR01SD	MJAA55	61° 06.01'	160° 53.60'
08384201	TR02SD	MJAA56	61° 07.07'	160° 50.61'
08384202	TR03SD	MJAA57	61° 06.44'	160° 44.75'
08384203	TR04SD	MJAA58	Not Recorded	Not Recorded
08384204	TR05SD	MJAA59	61° 04.00'	160° 37.25'
08384205	TR06SD	MJAA60	61° 00.86′	160° 34.55'
08384206	TR07SD	MJAA61	60° 55.56'	160° 31.59'
08384207	TR08SD	MJAA62	60° 57.84'	160° 28.30'
08384208	TR09SD	MJAA63	60° 57.79'	160° 24.26′
08384209	TR10SD	MJAA64	60° 57.53'	160° 20.91'
08384210	TR11SD	MJAA65	60° 57.17'	160° 16.91'
08384211	TR12SD	MJAA66	60° 57.97'	160° 12.97'
08384212	TR13SD	MJAA67	60° 57.90'	160° 12.97'
08384213	TR14SD	MJAA68	60° 58.35'	160° 5.68'
08384214	TR15SD	MJAA69	60° 58' 43.114"	160° 4 26.248"
08384215	TR16SD	MJAA70	60° 59' 31.309"	159° 58" 47.006"
08384216	TR17SD	MJAA71	61° 2' 07.010"	159° 56" 14.887"
08384217	TR18SD	MJAA72	61° 3' 13.722"	159° 56' 09.333"
08384228	FR01SD	MJAA83	61° 04.65'	160° 41.03'
08384229	GC01SO	MJAA84	60° 58.81'	160° 5.53'
08384230	GC02SO	MJAA85	60° 58.81'	160° 5.53'
08384231	GC03SO	MJAA86	60° 58.81'	160° 5.53'
08384232	GC04SD	MJAA87	60° 58.81'	160° 5.53'
08384240	TP01SD	MJAA95	61° 03' 07.485"	159° 47' 47.721'
08384241	WS01SO	MJAA96	61° 01' 22.710"	159° 50' 32.453"
08384242	WS02SO	MJAA97	61° 01' 22.710"	159° 50' 32.453"
08384243	WS03SO	MJAA98	61° 01' 22.710"	159° 50' 32.453"
08384261	DS01SO	MJAAB6	60° 58' 44.365'	160° 04' 23.416"
08384262	DS02SO	MJAAB7	60° 59' 1.787'	160° 1' 57.670"
08384263	DS03SO	MJAAB8	60° 59' 22.949'	159° 58' 41.443"
08384301	BG01SD	MJAAF6	60° 59.67'	160° 5.51'
08384302	BG02SD	MJAAF7	61° 05' 25.155"	159° 43' 37.742'
08384303	BC01SD	MJAAF8	61° 00' 36.269'	159° 54' 1.799"

Key:

 $CLP = \ Contract \ Laboratory \ Program.$

 $EPA = \ United \ States \ Environmental \ Protection \ Agency.$

ID = Identification.



Data Validation Memoranda

ecology and environment, inc.

International Specialists in the Environment

720 Third Avenue, Suite 1700, Seattle, WA 98104 Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE:

January 9, 2009

TO:

Mark Woodke, Project Manager, E & E, Seattle, Washington

FROM:

Bryan Vasser, START-3 Chemist, E & E, Seattle, Washington Mu

SUBJ:

Data Summary Check, Tuluksak River Site,

Tuluksak, Alaska

REF:

TDD: 08-02-0017

PAN: 002233.0324.01SI

The data summary check of 20 sediment/soil samples collected from the Tuluksak River site in Tuluksak, Alaska, has been completed. Mercury analyses (EPA CLP SOW ILM05.4) were performed by Chemtech, Mountainside, New Jersey.

The samples were numbered:

MJAA55 MJAA61	MJAA56 MJAA62	MJAA57 MJAA63	MJAA58 MJAA64	MJAA59 MJAA65	MJAA60 MJAA66
MJAA67	MJAA68	MJAA69	MJAA70	MJAA71	MJAA72
MTA 4.83	MIAAE6			•	•

No discrepancies were noted. The secondary reviewer reapplied the "J" (estimated quantity) qualifier back to results that were originally qualified "J" by the laboratory when deleted by the primary reviewer.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 10

1200 Sixth Avenue, Suite 900 Seattle, Washington 98101

November 24, 2008

Reply To

Attn. Of: OEA-095

MEMORANDUM

SUBJECT: Data Validation for Tuluksak River SI,

Case# 37825, SDG: MJAA56, Mercury Analyses

FROM: Jennifer Crawford, Chemist

Environmental Services Unit, OEA

TO: Brandon Perkins, Site Assessment Manager

Office of Environmental Cleanup (ECL-112)

CC: Renee Nordeen, Ecology & Environment

The data validation of inorganic analyses for the above sample set is complete. Twenty (20) soil samples were analyzed for mercury (CVAA) by Chemtech Laboratory, Mountainside, NJ. Sample numbers for this delivery group are:

MJAA55	MJAA56	MJAA57	MJAA58	MJAA59	MJAA60	MJAA61
MJAA62	MJAA63	MJAA64	MJAA65	MJAA66	MJAA67	MJAA68
MJAA69	MJAA70	MJAA71	MJAA72	· ESAALM	MJAAF6	*

DATA QUALIFICATIONS

The following comments refer to the lab's performance in meeting the specifications outlined in the "CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILM05.4", the "USEPA CLP National Functional Guidelines for Inorganic Data Review" and the judgment of the reviewer. The comments presented herein are based on the information provided for the review.

TIMELINESS - Acceptable

No technical holding time requirements have been established for mercury in solid matrices. Samples were collected on 09/16/2008 and 09/17/2008. Mercury analysis (CV-AAS) was conducted on 10/23/2008.

INSTRUMENT CALIBRATION/VERIFICTION - Acceptable

A blank and five standards were analyzed for instrument calibration.



The correlation coefficient (0.9999) was within the linearity criterion (≥ 0.995) . Recoveries for verification standards (96-103%) met the frequency (10%) and recovery (80-120%) criteria.

Quantitation verification standards met both the frequency and recovery criteria for all analytes.

LABORATORY CONTROL SAMPLES (LCS) - Acceptable

Analyte recoveries for the LCS were within the established control limits for solid samples.

BLANKS - Acceptable

Preparation and instrument control blanks were prepared and analyzed in accordance with method requirements. Detected blank results were below the quantitation limit.

MATRIX SPIKE ANALYSIS - Acceptable

A matrix spike analysis was performed for sample MJAAF6. Fercent recovery was within the recovery criterion (75-125%).

DUPLICATE SAMPLE ANALYSIS - Acceptable

A duplicate sample analysis was performed for sample MJAAF6. Relative percent difference (RPD) was not calculated for the duplicate sample analysis, as both native and duplicate had non-detect results.

ASSESSMENT SUMMARY

The following is a summary of qualified data:

Samples MJAA64 and MJAAF6 were qualified (UJL) due to both having a negative result slightly less than the negative CRQL. Values for these samples may be biased low.

Sample results above the lab MDL and below the CRQL were qualified (Q).

DATA QUALIFIERS

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- J The associated value is an estimated quantity.
- R The data are unusable. The analyte may or may not be present in the sample.
- UJ The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.



PROJECT SPECIFIC DATA QUALIFIERS:

- L Low bias.
- H High bias.
- K Unknown Bias.
- Q Detected concentration is below the method reporting limit / Contract Required Quantitation Limit, but is above the method detection limit.

1A-IN Morganic analysis data sheet

EPA SAMPLE NO.

Lab Code: CHEM Case No.: 37825 NRAS No.: SDG No.: MJAA56			ONSULTING GR						
Date Received: 09/24/2008	Lab Code:	<u>CHEM</u>	Case No.: <u>3782</u>	5 NRAS No		SDG No.	: MJAA56		
A Solids: 49-0 52-17. Po 73	Matrix: (so	il/water) SOIL		Lab San	ple ID <u>: Z5</u>	072-02		_	,
A Solids: 49-0 52-17. Po 73	Level: (low	/med) LOW		Date Rec	ceived <u>: 09/2</u>	24/2008		_	
CAS No. Analyte Concentration C Q M	ov m-1:3	40.00 mm/m	11/21/08				.r		
CAS No. Analyte Concentration C Q M	% Sonds:	497.0 57.67.07.	[Pg 15]	writty	•				
CAS No. Analyte Concentration C Q M 7429-90-5 Aluminum NR 7440-36-0 Antimony NR 7440-38-2 Arsenic NR 7440-38-2 Arsenic NR 7440-41-7 Beryllium NR 7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-47-3 Chromium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-95-1 Lead NR 7439-95-1 Magnessum NR 7439-96-5 Mercury 0.20 CV 7440-02-0 Nickel NR 7440-02-0 Nickel NR 7440-02-0 Nickel NR 7440-23-5 Sodium NR 7440-23-6 Soldium NR 7440-23-7 Transium NR 7440-23-8 Transium NR 7440-23-9 Transium NR 7440-23-0 Transium NR 7440-25-0 Transium Tr	Concentrat	ion Units (ug/L o	or mg/kg dry weig	ht): MG/KG					•
7429-90-5 Aluminum NR 7440-36-0 Antimony NR 7440-38-2 Arseniz NR 7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-70-2 Calcium NR 7440-43-3 Chromium NR 7440-43-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-97-5 Marganese NR 7439-97-6 Mercury 0.20 √ CV 7440-02-0 Nickel NR 7440-02-1 Nickel NR 7440-02-7 Potassium NR 7440-22-4 Silver NR 7440-22-5 Sodium NR 7440-22-0 Tallium NR <									
7440-36-0 Antimony NR 7440-38-2 Arseniz NR 7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-41-7 Beryllium NR 7440-43-9 Calcium NR 7440-47-3 Chromium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-89-6 Iron NR 7439-91-1 Lead NR 7439-95-1 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.20 √ CV 7440-02-0 Nickel NR 7440-02-1 Vickel NR 7440-24-2 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR 757-12-5 Cyanide Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: Artifacts: Oz 11/21/08 Color After: YELLOW Clarity After: Artifacts: Artifacts: Oz 11/21/08 Artifacts: Artifacts: Oz 11/21/08 Color After: YELLOW Clarity After: Artifacts: Oz 11/21/08 Artifacts: Oz 11/21/08 Artifacts: Oz 11/21/08 Color After: YELLOW Clarity After: Artifacts: Oz 11/21/08 Artifacts: Oz 11/21/08 Color After: YELLOW Clarity After: Artifacts: Oz 11/21/08 Color After: YELOW Clarity After: Artifacts: Oz 11/21/08 Color After: YELLOW Clarity After: Artifacts: Oz 11/21/21/21/21/21/21/21/21/21/21/21/21/2		CAS No.	Analyte	Concentration	С	Q	M		
7440-38-2 Arsenic Nik		7429-90-5	Aluminum				NR		
7440-39-3 Barium NR 7440-41-7 Beryllium NR NR 7440-43-9 Cadmium NR NR 7440-70-2 Calcium NR NR 7440-47-3 Chromium NR NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-89-6 Iron NR 7439-96-5 Maganesium NR 7439-96-5 Maganese NR 7439-96-5 Maganese NR 7439-97-6 Mercury 0.20		7440-36-0	Antimony				NR		
7440-41-7 Beryllium		7440-38-2	Arsenio				NR.		
7440-43-9 Cadmium		7440-39-3	Barium				NR		
7440-70-2 Calcium		7440-41-7	Beryllium	· · · · · · · · · · · · · · · · · · ·			NR.		
7440-70-2 Calcium					1		NR		-
7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-5 Magnesium NR 7439-96-5 Marganese NR 7440-02-0 Nickel NR 7440-02-0 Nickel NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR 7440-66-6 Zinc NR 7440-66-6 Zinc NR 7000 Before; BROWN Clarity Before; Texture; MEDIUM Color After: YELLOW Clarity After: Artifacts; Artifacts;							NR		
7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.20	•								
7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.20	•								
7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.20 √ CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-2 Vanadium NR 7440-66-6 Zinc NR 57-12-5 Cyanide NR Color After: YELLOW Clarity After: Artifacts:					1 1				
7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.20 √ CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-22-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR 57-12-5 Cyanide NR Color Before: BROWN Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: Artif					 				
7439-95-4 Magnesium NR 7439-96-5 Manganese NR NR 7439-97-6 Mercury 0.20				· · · · · · · · · · · · · · · · · · ·	 				-
7439-96-5 Manganese NR 7439-97-6 Mercury 0.20 √ CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR 57-12-5 Cyanide NR Color Before: BROWN Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: Arti	•			· · · · · · · · · · · · · · · · · · ·					•
7439-97-6 Mercury 0.20 √ CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR 57-12-5 Cyanide NR Color Before: BROWN Clarity Before: Clarity After: Artifacts: Artifacts: Artifacts:				•	 				
Texture: MEDIUM Texture: M				0.20 √					
7440-09-7 Potassium NR NR 7782-49-2 Selenium NR NR NR 7440-22-4 Silver NR NR 7440-23-5 Sodium NR NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR S7-12-5 Cyanide NR NR S7-12-5 Cyanide NR Color Before: BROWN Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: OL 11 21 08				0.20	 			•	
7782-49-2 Selenium					 	····			
7440-22-4 Silver NR 7440-23-5 Sodium NR NR 7440-28-0 Thallium NR NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR S7-12-5 Cyanide NR NR Color Before: BROWN Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: OL 11/21/08 Color After: Color After: YELLOW Clarity After: Artifacts: OL 11/21/08 Color After: YELLOW Clarity After: Artifacts: OL 11/21/08 Color After: YELLOW Clarity After: OL 11/21/08 Color After: O				· · · · · · · · · · · · · · · · · · ·	-				
7440-23-5 Sodium NR 7440-28-0 Thallium NR NR 7440-62-2 Vanadium NR NR 7440-66-6 Zinc NR S7-12-5 Cyanide NR NR S7-12-5 Cyanide NR Color Before: BROWN Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: OL 11/21/08 Color After: YELLOW Clarity After: OL 11/21/08 Color Afte	\			:					
7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR 57-12-5 Cyanide NR Color Before: BROWN Clarity Before: Texture: MEDIUM Artifacts: Artifacts: Out 11/21/08					<u> </u>				-
7440-62-2 Vanadium NR 7440-66-6 Zinc NR 57-12-5 Cyanide NR Color Before: BROWN Clarity Before: Clarity After: Artifacts: Out 11/21/08									
7440-66-6 Zinc NR 57-12-5 Cyanide NR Color Before: BROWN Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: OL 11/21/08	•			,		<u> </u>			
S7-12-5 Cyanide NR NR Color Before: BROWN Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: OL 11 21 08						<u> </u>	→		
Color Before: BROWN Clarity Before: Texture: MEDIUM Color After: YELLOW Clarity After: Artifacts: OL 11/21/08									
Color After: YELLOW Clarity After: Artifacts: OL 11/21/08		57-12-5	Cyanide				NR		
Color After: YELLOW Clarity After: Artifacts: OL 11/21/08					·				
Color After: YELLOW Clarity After: Artifacts: OL 11/21/08							<u> </u>		
Color After: YELLOW Clarity After: Artifacts: OL 11/21/08						_ : .		-	
	Color Befor	e: BROWN	Clarity	Before:		Texture: MI	<u>EDIUM</u>		
	Talan A Aan	VELLOW	Clanity	. A O am		A set for set a			.12,108
	JOIOT ALLET.	IELLOW	Ciarity	Alter		Al mads:		or	11 6.7.
	Comments:	•							•

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA	SAN	IPL	Æ	NO
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		MJAA56
Lab Name CHEMTECH CONSULTING GROUP	Contract: EPW06047	
Lab Code: <u>CHEM</u> Case No.: <u>37825</u>	NRAS No.: SDG No	o.: MJAA56
Matrix: (soil/water) SOIL	Lab Sample ID: <u>Z5072-01</u>	<u> </u>
Level: (low/med) LOW	Date Received: 09/24/2008	
% Solids: 50.0		
Concentration Units (ug/L or mg/kg dry weight): M	IG/KG	•

CAS No.	Analyte	Concentration	C.	Q	М
7429-90-5	Aluminum			7	NR
7440-36-0	Antimony	ŀ			NP
7440-11-1	Arsen c				NR.
7440-39-3	Barium		1		NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt	:			NR
7440-50-8	Copper		T		NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese	,			NR
7439-97-6	Mercury	0.20	Ū	✓	CV
7440-02-0	Nickel	3			NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	•			NR
7440-23-5	Sodium	,			NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide			. '	NR
	1				
				·	

Color Before: BROWN	Clarity Before:	Texture: MEDIUM
Color After: YELLOW	Clarity After:	Artifacts:
Comments:		

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA	SA	MP	JF.	NO
	20	шущ і		110

M.TAA57

•		NUAA57
Lab Name CHEMTECH CONSULTING GROUP	Contract: EPW06047	
Lab Code: <u>CHEM</u> Case No.: <u>37825</u>	NRAS No.:	SDG No.: MJAA56
Matrix: (soil/water) SOIL	Lab Sample ID <u>: Z5072-03</u>	<u>.</u>
Level: (low/med) LOW	Date Received: 09/24/200	8
% Solids: 78.5		
Concentration Units (ng/L or mg/kg dry weight): M	IG/KG	

CAS No.	Analyte	Concentration	C.	Q	M
7429-90-5	Aluminum			1	N
7440-36-0	Antimony				NF
7440-35-2	Arsenic		F		NF
7440-39-3	Barium		i		NI
7440-41-7	Beryllium				N
7440-43-9	Cadmium		1		NI
7440-70-2	Calcium				NI
7440-47-3	Chromium				NE
7440-48-4	Cobalt				N
7440-50-8	Copper				NI
7439-89-6	Iron				NE
7439-92-1	Lead		1		NF
7439-95-4	Magnesium				NE
7439-96-5	Manganese			,	NE
7439-97-6	Mercury	0.12	U	V	CV
7440-02-0	Nickel				NF
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	· · · · · · · · · · · · · · · · · · ·			NR
7440-23-5	Sodium		<u> </u>		NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc		1		NR
57-12-5	Cyanide				NR
					1
					+

Color Before: BROWN	Clarity Before:	Texture: MEDIUM
Color After: YELLOW	Clarity After:	Artifacts:
Comments:		Je 11/21/00

1A-IN

EPA		

ah Name	CHEMTECH CA	ONSULTING GRO	<u>.</u> D <u>UP</u> Contract: <u>EP</u>	3306047		MJAA
			NRAS No.:		SDG N	o.: MJAA56
	il/water <u>) SOIL</u>			ple ID <u>: Z5</u>	• .	· · · · · · · · · · · · · · · · · · ·
	/med) LOW	•				
svet. (10M	//IIIeu] LOW		Date Rec	eived <u>: 09/</u>	24/2008	
Solids: :	52.1					٠.
ncentrati	ion Units (ne/L.c	or mg/kg dry weigh	th MG/RG			
· · · · · · · · · · · · · · · · ·	ion cinii (ugii)	n ingrig dry weigh	icj. Tororico		· · · · · · · · · · · · · · · · · · ·	
	CAS No.	Analyte	Concentration	С	Q .	м
	7429-90-5	Aluminum				NR
		Antimony			· · · · · · · · · · · · · · · · · · ·	NR
	74-10-38-2			i		NR
	7440-39-3				· , · · · · · · · · · · · · · · · · · ·	NR
		Beryllium	· · · · · · · · · · · · · · · · · · ·			NR
		Cadmium			** **	NR
	7440-70-2	Calcium	,			NR
	7440-47-3	Chromium			 	NR
•	7440-48-4	Cobalt				NR
	7440-50-8	Copper				NR
ſ						NR
	7439-92-1	Lead				NR
i	7439-95-4	Magnesium				NR
j		Manganese				NR
i	7439-97-6		0.18	Ū		CV
Ī	7440-02-0	Nickel		· ·		NR
	7440-09-7	Potassium			, , , , , , , , , , , , , , , , , , , ,	NR
. [7782-49-2	Selenium			<u>-</u>	NR
. [7440-22-4	Silver				NR .
Ī	7440-23-5	Sodium				NR
Γ	7440-28-0	Thallium		,		NR
	7440-62-2	Vanadium				NR
Ī	7440-66-6	Zinc			·····	NR
. [57-12-5	Cyanide				NR
· [1		····································	1
. [
_		<u></u>				···
or Before	: BROWN	Clarity	Вебоге:		Texture: <u>M</u>	<u>EDIUM</u>
	YELLOW	Clarity		•		

olor Berore: BRUWN	Clarity Before:	Texture: MEDIUM
olor After: YELLOW	Clarity After:	Artifacts:
omments:		or 11/21/0

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

			MJAA59
Lab Name CHEMTECH CONSULTING GROUP	Contract: EPW06047	<u> </u>	
Lab Code: <u>CHEM</u> Case No.: <u>37825</u>	NRAS No.:	SDG No.: MJA	.A.56
Matrix: (soil/water) SOIL	Lab Sample ID: Z5072-0	5	
Level: (low/med) LOW	Date Received: 09/24/200	08	·
% Solids <u>: 67.7</u>			
Concentration Units (ug/L or mg/kg dry weight); M	IG/KG		~
	····	~	

7440-36-0 / 7440-39-3 F	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper				,		NE NE
7440-39-3 F 7440-41-7 F 7440-43-9 C 7440-70-2 C 7440-47-3 C 7440-48-4 C 7440-50-8 C 7439-89-6 F 7439-92-1 C 7439-95-4 C 7439-96-5 C 7439-97-6 C 7440-02-0 C	Arsenic Barjum Beryllium Cadmium Calcium Chromium Cobalt				,		NE NE NE
7440-39-3 F 7440-41-7 F 7440-43-9 C 7440-70-2 C 7440-47-3 C 7440-48-4 C 7440-50-8 C 7439-89-6 In 7439-92-1 L 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N	Barium Beryllium Cadmium Calcium Chromium Cobalt						NE NE NE
7440-41-7 E 7440-43-9 C 7440-70-2 C 7440-47-3 C 7440-48-4 C 7440-50-8 C 7439-89-6 In 7439-92-1 L 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N	Beryllium Cadmium Calcium Chromium Cobalt						NF NF
7440-43-9 C 7440-70-2 C 7440-47-3 C 7440-48-4 C 7440-50-8 C 7439-89-6 In 7439-92-1 I 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N	Cadmium Calcium Chromium Cobalt						NI
7440-70-2 C 7440-47-3 C 7440-48-4 C 7440-50-8 C 7439-89-6 In 7439-92-1 I 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N	Calcium Chromium Cobalt						
7440-47-3 C 7440-48-4 C 7440-50-8 C 7439-89-6 In 7439-92-1 L 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N	Chromium Cobalt	-			1		NII
7440-48-4 C 7440-50-8 C 7439-89-6 In 7439-92-1 L 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N	Cobalt				1		1 1/1
7440-50-8 C 7439-89-6 In 7439-92-1 I 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N							NI
7439-89-6 In 7439-92-1 I 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N	Copper						NI
7439-92-1 L 7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N							NI
7439-95-4 N 7439-96-5 N 7439-97-6 N 7440-02-0 N	ron						NI
7439-96-5 N 7439-97-6 N 7440-02-0 N	ead			1			NI
7439-97-6 N 7440-02-0 N	/lagnesium						NI
7440-02-0 N	/langanese		-	1			N
	/iercury		0.15 🗸	7 0			CV
7440-09-7 P	lickel			1			NF
	otassium						NF
7782-49-2 S	elenium						NF
7440-22-4 S	ilver	-		1		·····	NE
7440-23-5 S	odium			1			NR
7440-28-0 T	hallium	,		1			NR
7440-62-2 V	anadium						NR
7440-66-6 Z	inc	,		1	-		NR
57-12-5 C	yanide				·		NR
		,		1			_
						·	

Color Before <u>: BROWN</u> Color After: <u>YELLOW</u>		Clarity Before:	Texture: <u>MEDIUM</u>
		Clarity After:	_ Artifacts:
Comme	ents:		or 11/21/08
			1
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1A-IN INORGANIC ANALYSIS DATA SHEET

EPA	SA	MPI	Æ	NO
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b Name_	CHEMTECH CO	ONSULTING GR	OUP Contract; EP	W06047		MJ	AA60
b Code: _	СНЕМ	Case No.: 3782	NRAS No.:		SDG-No	.: MJAA56	i
ntrix: (soi	il/water <u>) SOIL</u>		Lab San	iple ID <u>: Z5</u>	072-06		
vel: (low	/med)_LOW	<u></u>	Date Re	ceived: 09/	24/2008		
Solids <u>: 6</u>	50.5						
ncentrati	on Units (ug/L o	or mg/kg dry weig	ht): MG/KG				*,
,	CAS No.	Analyte	Concentration	'C	Q ·	М	
	7429-90-5	Aluminum				NR	
	7440-36-0					NR	
Ì	744(-38-2					Ni	
	7440-39-3	Barium				NR.	
Ī	7440-41-7	Beryllium				NR	
Ī	7440-43-9	Cadmium				NR	
Ī	7440-70-2	Calcium				NR	
	7440-47-3	Chromium				NR	
. [7440-48-4	Cobalt	· · · · · · · · · · · · · · · · · · ·			NR	
. [7440-50-8					NR	
, [7439-89-6					NR	
. [7439-92-1					NR	
		Magnesium	•			NR	
<u> </u>		Manganese	/		<u> </u>	NR	
	7439-97-6		0.15 🗸	ט		CV	
1	7440-02-0				<u> </u>	NR	
`. ·	7440-09-7					NR	
	7782-49-2					NR	
	7440-22-4					NR	
. [7440-23-5				· · · · · · · · · · · · · · · · · · ·	NR	
-	7440-28-0		·			NR	•
. ⊢	7440-62-2		· · · · · · · · · · · · · · · · · · ·		·	NR	•
Į.	7440-66-6					NR	•
F	57-12-5	Cyanide				NR	
-						+	
r Before	: BROWN	Clarity	Before:		Texture: M	EDIUM	
	YELLOW		After:		Artifacts:		-
ments:				<u> </u>			or 11/21

IA-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name (СНЕМТЕСН С	ONSULTING GR	OUP Contract: EF	W06047		MJ	AA61
			5 NRAS No.:		SDG N	io.: MJAA56	
Matrix: (soi	l/water) SOIL		Lab San	nple ID <u>: Z5</u>	072-07		
Level: (low	med) LOW		Date Re	ceived <u>: 09/</u> 2	24/2008		<u>-</u> -
% Solids <u>: 7</u>	5.0		:			•	
Concentration	on Units (ug/L o	or mg/kg dry weig	ght): MG/KG				
. [CAS No.	Analyte	Concentration	С	Q	M	
İ	7429-90-5	Aluminum				NR	•
ļ		Antimony				NP.	
Ī	7440-38-2	Arsenie '		1 1		NR	
[7440-39-3					NR	
		Beryllium			•	NR	
.]		Cadmium				NR.	
	7440-70-2					NR	
ļ		Chromium				NR	•,
į.	7440-48-4					NR	-
1	7440-50-8		<u> </u>			NR	
-	7439-89-6					NR ·	
<u> </u>	. 7439-92-1		····			NR	
1		Magnesium	· <u></u>			NR	
·		Manganese		<u> </u>		NR	
	7439-97-6		0.13	U		CV	
.	7440-02-0					NR	
· -		Potassium		· · · ·		NR	
	7782-49-2					NR	
- -	7440-22-4			<u> </u>		NR	ž.
. -	7440-23-5					NR	•
-	7440-28-0					NR	
-	7440-62-2					NR	
-	7440-66-6		.2			NR.	
Ļ	57-12-5	Cyanide				NR	
					<u>- ' </u>		
L.			·				
lor Before	BROWN	Clarity	y Before:		Texture:]	MEDIUM	-
lor After:_	YELLOW	Clarity	After:		Artifacts:		01121/0
mments;		. •					1 -

IA-IN INORGANIC ANALYSIS DATA SHEET

EPA	SAMP	LE NO
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	INORG.	ANIC ANALYSIS D	ATA SE	EET		
					МЈА	A62
Lab Name CHEMTECH (CONSULTING GR	OUP Contract; EP	W06047	7	· · · · · · · · · · · · · · · · · · ·	·
Lab Code: CHEM	Case No.: 3782	NRAS No.:		SDG N	lo.: MJAA56	
Matrix: (soil/water) SOIL		Lab San	ple ID <u>:</u>	Z5072-08		
Level: (low/med) LOW		Date Re	ceived <u>: (</u>	09/24/2008	·	
% Solids <u>: 71.9 /</u>		· · · · · · · · · · · · · · · · · · ·				
Concentration Units (ug/L	or mg/kg dry weig	ght): MG/KG		·	•	
CAS No.	Analyte	Concentration	С	Q	М	
7429-90-5	Aluminum				NR	
7440-36-0	Antimony				NR	
	Arsenic				NIC +	
	Barium				NR	
	Beryllium		1		NR	
	Cadmium	·			NR	
	Calcium				NR	
	Chromium			, , , , , , , , , , , , , , , , , , ,	NR	,
7440-48-4					NR	
7440-50-8					NR .	
7439-89-6					NR NR	•
7439-92-1				<u> </u>	NR	
	Magnesium				NR	• •
	Manganese	/	1		NR	•
	Mercury	0.14 ✓	U		CV	
7440-02-0			- 1		NR	:
	Potassium				NR	
	Selenium				NR	
7440-22-4			<u> </u>		NR	
7440-23-5					NR	
	Thallium				NR	
	Vanadium				NR	•
7440-66-6				±.	NR	
57-12-5	Cyanide				NR	
		1				
				¢		* * * * * * * * * * * * * * * * * * * *
Color Before: BROWN	Clarit	y Before:		Texture;	MEDIUM	02/1/21/08
Color After: YELLOW	Clarit	y After:		Artifacts:		
Comments:				•	•	
	•				•	

EPA SAMPLE N	റ	C
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		INORG	IA-IN ANIC ANALYSIS DA	ለጥለ ሮህ	EET	EPA SAMI	LE NO.
						МЈА	163
Lab Name CHE	MTECH CO	ONSULTING GR	OUP Contract: EP	W06047			
Lab Code: <u>CHE</u>	<u> </u>	Case No.: <u>3782</u>	5 NRAS No.:_		SDG N	n.: MJAA56	
Matrix: (soil/wat	ter <u>) SOIL</u>		Lab Sam	ple ID <u>: </u>	Z5072-09	<u> </u>	•
Level: (low/med)) LOW		Date Rec	eived <u>: 0</u>	9/24/2008	· · · · · · · · · · · · · · · · · · ·	•
% Solids: 75.0						. •	
Concentration Ur	nits (ug/L o	r mg/kg dry weig	ht): MG/KG				
	CAS No.	Analyte	Concentration	C	Q.	М	
		Aluminum					
		Antimony				NR NP.	•
	7440-35-2			<u> </u>			
	7440-39-3			1		NR NR	
		Beryllium		 		NR	
	7440-43-9	·		 		NR	
	7440-70-2			 	· · · · · · · · · · · · · · · · · · ·	NR	
		Chromium		-		NR	
	7440-48-4			 -		NR.	•
	7440-50-8		·	 		NR	
	7439-89-6					NR	•
	7439-92-1					NR	
		Magnesium				NR	
		Manganese				NR NR	
- 	7439-97-6	Mercury	0.13 🗸	U		CV	
	7440-02-0		0.13	-		NR	
		Potassium				NR	
	7782-49-2				· · · · · · · · · · · · · · · · · · ·	NR NR	•
	7440-22-4					NR	-
	440-23-5					NR	
	440-28-0		·		·	NR	
	440-62-2		,			NR NR	
	440-66-6					NR NR	
 	57-12-5		· · · · · · · · · · · · · · · · · · ·	 -	· · · · · · · · · · · · · · · · · · ·	NR	
		0,1220	<u> </u>		· · · · · · · · · · · · · · · · · · ·	1410	
Color Before <u>: BR</u>	OWN	Clarity	/ Before:	·	Texture: N	(EDIUM	
Color After: YELI	LOW	Clarity	After:		Artifacts:_		.
Comments:							01/21/08
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IA-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE N

INORGA	NIC ANALYSIS DATA SHE	TET	
Lab Name CHEMTECH CONSULTING GRO	•		MJAA64
Lab Code: <u>CHEM</u> Case No.: <u>37825</u>	NRAS No.:	SDG N	o.: MJAA56
Matrix: (soil/water) SOIL	Lab Sample ID <u>: Z</u>	5072-10	
Level: (low/med) LOW % Solids: 73.1	Date Received: 09	/24/2008	·
Concentration Units (ug/L or mg/kg dry weigh	it): MG/KG		
CAS No. Analyte	Concentration C	Q	М
5400 po F 11 1		· · · · · · · · · · · · · · · · · · ·	

	CAS No.	Analyte	Concentration	, C	Q	M
	7429-90-5					NR
	7440-36-0	Antimony				NR
	744(-38-2	Arsenic	1	Ï		NF.
. [7440-39-3	Barium				NR
	7440-41-7	Beryllium				NR
	7440-43-9	Cadmium				NR
	7440-70-2	Calcium				NR
	7440-47-3	Chromium			4.	NR
	7440-48-4	Cobalt				NR
	7440-50-8	Copper				NR
	7439-89-6	Iron				NR
	7439-92-1	Lead				NR
	7439-95-4	Magnesium				NR
	7439-96-5	Manganese				· NR
	7439-97-6	Mercury	0.14	W L	JL-	CV
	7440-02-0	Nickel				NR
	7440-09-7	Potassium				NR
	7782-49-2	Selenium				NR
	7440-22-4	Silver		1		NR
Ŀ	7440-23-5	Sodium				NR
	7440-28-0	Thallium				NR
	7440-62-2	Vanadium				NR
	7440-66-6	Zinc				NR
	57-12-5	Cyanide				NR
					•	
						
				·		·

0211/21/08

Color Before: BROWN	Clarity Before:	Texture: MEDIUM
Color After: YELLOW	Clarity After:	Artifacts:
Comments:		

1A-IN NORGANIC ANALYSIS DATA SHEET

	E NO.

742 744 744 744 744 744 744 743 743 743 743	SOIL OW (ug/L o No. 19-90-5 0-36-0 0-36-2 0-39-3 0-41-7 0-43-9 0-70-2	r mg/kg dry weig Analyte Aluminum Antimony Arsenic Barium Beryllium	5 NRA		ple ID	: Z5072	-11	M NR	5 —
Matrix: (soil/water) Level: (low/med) L % Solids: 80.2 Concentration Units CAS 744 744 744 744 744 743 743 74	SOIL OW (ug/L o No. 19-90-5 0-36-0 0-38-2 0-39-3 0-41-7 0-43-9 0-70-2	r mg/kg dry weig Analyte Aluminum Antimony Arsenic Barium Beryllium] :ht <u>): MG/KG</u>	Lab Sam Date Rec	ple ID	: Z5 <u>072</u>	-11 .008	М	
CAS CAS 744 744 744 744 744 743 743 74	(ug/L o No. 19-90-5 0-36-0 0-38-2 0-39-3 0-41-7 0-43-9 0-70-2	r mg/kg dry weig Analyte Aluminum Antimony Arsenic Barium Beryllium	tht): MG/KG	Date Rec	eived <u>:</u>		800		-
CAS CAS 742 744 744 744 744 744 743 743	(ug/L o No. 19-90-5 0-36-0 0-38-2 0-39-3 0-41-7 0-43-9 0-70-2	Analyte Aluminum Antimony Arsenic Barium Beryllium	ht <u>): MG/KG</u>			09/24/2			-
Concentration Units CAS 742 744 744 744 744 744 743 743	9-90-5 0-36-0 0-38-2 0-39-3 0-41-7 0-43-9 0-70-2	Analyte Aluminum Antimony Arsenic Barium Beryllium			C		Q		
CAS 742 744 744 744 744 744 743 743 743 744 744	9-90-5 0-36-0 0-38-2 0-39-3 0-41-7 0-43-9 0-70-2	Analyte Aluminum Antimony Arsenic Barium Beryllium			<u>-</u>	` 	Q		
742 744 744 744 744 744 744 743 743 743 743	9-90-5 0-36-0 0-38-2 0-39-3 0-41-7 0-43-9 0-70-2	Aluminum Antimony Arsenic Barium Beryllium	Concentra	ation	С		'Q		
742 744 744 744 744 744 744 743 743 743 743	9-90-5 0-36-0 0-38-2 0-39-3 0-41-7 0-43-9 0-70-2	Aluminum Antimony Arsenic Barium Beryllium	Concenti			1	ν		
744 744 744 744 744 744 744 743 743 743	0-36-0 (-38-2 (0-39-3 (0-41-7 (0-43-9 (0-70-2	Antimony Arsenic Barium Beryllium		<u>-</u>					
744 744 744 744 744 744 743 743 743 743	0-38-2 0-39-3 0-41-7 0-43-9 0-70-2	Arsenic Barium Beryllium			1 -	 		NR NR	
744 744 744 744 744 743 743 743 743 743	0-39-3 0-41-7 0-43-9 0-70-2	Barium Beryllium			i i	í		· NR	
744 744 744 744 744 743 743 743 743 743	0-41-7 0-43-9 0-70-2	Beryllium				 		NR	
744 744 744 744 743 743 743 743 743 7444 7444	0-43-9 0-70-2				<u> </u>	 		NR	
744 744 744 743 743 743 743 743 7444 7444	0-70-2	Cadmium		,		1		NR	
744 744 743 743 743 743 743 7444 7444	0.45.0	Calcium						NR	
744 743 743 743 743 743 7444 7440	0-47-3	Chromium				· · ·		NR	·
743: 743: 743: 743: 743: 7444: 7782	0-48-4	Cobalt						NR	
743: 743: 743: 743: 7444: 7782	0-50-8	Copper						NR	<u>, </u>
7439 7439 7444 7444 7782	9-89-6	Iron				i	••••	NR	-
7439 7439 7440 7440 7782	9-92-1	Lead						NR	•
7439 7440 7440 7782	9-95-4	Magnesium					۲.	NR	· ·
7440 7440 7782		Manganese						NR	
7440 7782		Mercury	. (0.12 🗸	U			CV	
7782		Nickel						NR	
		Potassium						NR	
7440		Selenium						NR	
		Silver						NR	
 		Sodium						NR	•
		Thallium						NR	
		Vanadium						NR	
· · · · · · · · · · · · · · · · · · ·		Zinc						NR	,
37	7-12-5	Cyanide	· · · · · · · · · · · · · · · · · · ·					NR.	
						<u>-</u>			•
		<u></u>						-	-
or Before: BROW	N	Clarity	Before:				Texture: 1	MEDIUM	· ``.
or After: YELLO	W	Clarity	After:				Artifacts:		8211/20/0
mments:		1					,		. 🕶 1

1A-IN NORGANIC ANALYSIS DATA SHEET

EPA	SA	MP:	LΕ	NO
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INDRES	ANIC ANALYSIS DATA SHEET	
		MJAA66
Lab Name CHEMTECH CONSULTING GF	COUP Contract: EPW06047	
Lab Code: CHEM Case No.: 3782	25 NRAS No.: S	SDG No.: MJAA56
Matrix: (soil/water) SOIL	Lab Sample ID: <u>Z5072-12</u>	
Level: (low/med) LOW	Date Received: 09/24/2008	
% Solids: 59.2 \(\square \)		
Concentration Units (ug/L or mg/kg dry weig	ght): MG/KG	
CAS No. Analyte	Concentration C . Q) M
7429-90-5 Aluminum		I NR

CAS No.	Analyte	Concentration	С	. Q	М
7429-90-5	Aluminum				NR
7440-36-0	Antimony		•		NR
74-0-35-0	Arsenio	1			NI.
7440-39-3	Barium				NR.
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Ĭron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese	/			NR
7439-97-6	Mercury	0.18 🗸			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium			·	NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium		1		NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR
, ·	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	1.

Color Before: BROWN	Clarity Before:	Texture: <u>MEDIUM</u>
Color After: YELLOW	Clarity After:	Artifacts:
Comments:		Arthacis: Original of
		c .
		<u> </u>

IA-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

	СНЕМ	ONSULTING GI Case No.: 378	COUP Contract: EP NRAS No.:			No · MIA 4 54	5
	oil/water) SOIL				Z5072-13		,
IAIIIA. (SI	in water SOIL		rad San	ibie 115 <u>:</u>	<u> </u>		
evel: (lov	v/med)_LOW_	·	Date Rec	eived <u>: (</u>	9/24/2008		
. n_1:1	64.8		*				_
o 201102 <u>:</u>	04.8						
oncentrat	ion Units (ug/L o	or mg/kg dry wei	ght <u>): MG/KG</u>			•	
	CAS No.	Analyte	Concentration			74	
		<u>_</u>	Concentration	C	Q	M	
		Aluminum				NR NR	
		Antimony		<u>!</u>		NR NR	
	7440-38-2			:		NI.	
	7440-39-3					NR.	
		Beryllium				NR NR	
	7440-43-9					NR	
	7440-70-2					NR .	
	7440-47-3					NR	
-	7440-48-4					NR	
	7440-50-8				· · · · · · · · · · · · · · · · · · ·	NR.	
	7439-89-6					NR.	
	7439-92-1	Lead Magnesium				NR NR	
						NR NR	
		Manganese	0.14 \/		 	NR	•
	7439-97-6		0.14 🗸	U		CV	
	7440-02-0	Nickel	- · · · · ·		· · · · · · ·	NR	
	7440-09-7	Potassium				NR	
		Selenium				NR	
		Silver				NR ·	
	7440-23-5	Sodium		,-		NR NR	
	7440-28-0 7440-62-2	Thallium Vanadium			-	NR NR	
· ·			· · · · · · · · · · · · · · · · · · ·			NR NR	
		Zinc				NR.	
	57-12-5	Cyanide			1	NR	
}	•				 		
[· <u>·</u>			··· ··		
r Bafor	e: BROWN	Classit	y Before:	•) errorri	
الالزماد بن	- DIOWIN	Ciarit	y Deloie.		i exitire;	MEDIUM_	سان -
lor After:	YELLOW	Clarit	y After:		Artifacts		- B 11/2
,							-!
nments:			•				

1A-IN NORGANIC ANALYSIS DATA SHEET

EPA	SAMPL	Æ	NO
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olids <u>: 74.3 </u>	Code:	CHEM	Case No.: <u>3782</u>	25 NRAS No.: _		SDG No.:	MJAA56	-
CAS No.	trix: (so	il/water <u>) SOIL</u>		Lab Sam	ple ID <u>: Z5</u>	072-14		
CAS No.	vel: (low	/med)_LOW		Date Rec	eived: 09/	24/2008		
CAS No. Analyte Concentration C Q M	Solids: 1	743 J						-
CAS No. Analyte Concentration C Q M 7429-90-5 Aluminum NR 7440-36-0 Antimony NR 7440-35-1 Arsenic NI 7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-41-7 Beryllium NR 7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-99-1 Lead NR 7439-95-5 Manganesium NR 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7440-09-7 Potassium NR 7440-23-5 Sodium NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR						• .		
7429-90-5 Aluminum NR 7440-36-0 Antimony NR 7440-36-1 Arsenic NT. 7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-43-9 Cadmium NR 7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-48-4 Cobalt NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR NR 7440-02-0 Nickel NR NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR	ncentrati	on Units (ug/L	or mg/kg dry wei	ght <u>): MG/KG</u>		•		
7429-90-5 Aluminum NR 7440-36-0 Antimony NR 7440-36-1 Arsenic NT. 7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-43-9 Cadmium NR 7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-48-4 Cobalt NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR NR 7440-02-0 Nickel NR NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR		CAS No.	Analyte	Concentration	C	0	м	
7440-36-0 Antimony NR 7440-36-2 Arsenic Nr. 7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Magnesium NR 7440-02-0 Nickel NR 7440-02-0 Nickel NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR			· · · · · · · · · · · · · · · · · · ·					•
7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7439-89-6 Iron NR 7439-99-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Magnese NR 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR								
7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.12 V U 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR								
7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Marganese NR 7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-60-2 Nadium NR								
7440-43-9 Cadmium NR 7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR NR 7440-09-7 Potassium NR NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR					-			:
7440-70-2 Calcium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR NR 7440-09-7 Potassium NR NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	•							r
7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR NR 7440-09-7 Potassium NR NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	~							
7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7449-92-6 Mercury 0.12 V U 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	Ì							
7440-50-8 Copper NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.12 V U 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	. 1							
7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.12 V U 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR		7440-50-8	Copper			·		
7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.12 V U 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	~ [<u>-</u>		
7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	ſ					- · · · · · · · · · · · · · · · · · · ·		
7439-96-5 Manganese NR 7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	. [7439-95-4	Magnesium					
7439-97-6 Mercury 0.12 V U CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	Ī	7439-96-5	Manganese	/		****		
7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	ſ	7439-97-6		0.12 √	U			1
7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR		7440-02-0						
7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	1	7440-09-7	Potassium				+	
7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR		7782-49-2	Selenium					
7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	ſ	7440-22-4	Silver					
7440-28-0 Thallium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR	ſ	7440-23-5	Sodium					•
7440-62-2 Vanadium NR 7440-66-6 Zinc NR	. [7440-28-0	Thallium					
7440-66-6 Zinc NR	Γ	7440-62-2	Vanadium					•
57 10 5 1 0 . 11	Γ	7440-66-6	Zinc					
	Γ	57-12-5	Cyanide					
								
	Ī							
r Before: BROWN Clarity Before: Texture: MEDIUM	r Before	: BROWN	Clarity	Before:		Texture: ME	DIUM	
r After: YELLOW Clarity After: Artifacts: O	r After '	VELLOW	Clasic	. A from		4 -43E4-		02/

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA.	SA:	MPI	Æ	NO
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Lab Name	CHEMTECH C	ONSULTING GR	OUP Contract: El	W06047_		74165	AA69
Lab Code	СНЕМ	Case No.: <u>3782</u>	5 NRAS No.:		SDG N	o.: MJAA56	
Matrix: (s	oil/water) SOIL		Lab Sar	nple ID <u>: Z</u>	5072-15	•	
Level: (lov	w/med) LOW	•		ceived: 09			
	75.1 🗸						
			• .				
Concentra	tion Units (ug/L	or mg/kg dry weig	ght <u>): MG/KG</u>	<u> </u>		,	
	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5	Aluminum		T		NR	
	7440-36-0	Antimony			· · · · · · · · · · · · · · · · · · ·	NR	· ·
	7440-35-2	Arsenic :		1		NT.	
	7440-39-3					NR	
A	7440-41-7	Beryllium				NR	
	7440-43-9					NR	
	7440-70-2		•			NR	
		Chromium				NR	* .
	7440-48-4					NR	
	7440-50-8					NR	* .
	7439-89-6					NR	
	7439-92-1					NR	•
		Magnesium				NR	
		Manganese		<u> </u>		NR	
	7439-97-6	Mercury	0.13	U		CV	•
	7440-02-0					NR	•.
•	7440-09-7					NR	
	7782-49-2					NR	
	7440-22-4		!	<u> </u>	<u> </u>	NR	
	7440-23-5					NR	
	7440-28-0					NR	
	7440-62-2				· .	NR	
	7440-66-6		· · · · · · · · · · · · · · · · · · ·			NR	
ļ	57-12-5	Cyanide				NR	
ĺ		· .				·	
	e: BROWN		Before:		Texture; <u>N</u>	EDIUM	or 108
olor After:	YELLOW	Clarity	After:		Artifacts:_	<u> </u>	21/21/08
omments:			٠.		_		
CHILLICHICA.				•			

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA	SAMPL	E	Ν	IC

		INORG	ANIC ANALYSIS D	ATA SHEE	T		
	·			: •		МЈ	AA70
.ab Name_	<u>CHEMTECH C</u>	<u>ONSULTING GR</u>	OUP Contract: EP	W06047			
ab Code:	CHEM	Case No.: 3782	5 NRAS No.:	·	SDG N	o.: MJAA56	
latrix: (so	il/water) SOIL		Lab San	nple ID <u>: Z5</u> (072-16		,
evel: (low	/med) LOW	· .	Date Re	ceived: 09/2	24/2008		
Colider 4	_{53.7} ✓						<u> </u>
		•					
oncentrati	on Units (ug/L o	or mg/kg dry weig	ht <u>): MG/KG</u>				
	0.000					· · · · · · · · · · · · · · · · · · ·	
	CAS No.	Analyte	Concentration	C .	Q	M	
:		Aluminum				NR	•
		Antimony				NP.	
	7446-38-2					NA.	
•	7440-39-3					NR	
		Beryllium				NR	
ļ		Cadmium				NR.	
-	7440-70-2					NR	
		Chromium				NR	
į	7440-48-4	Cobalt				NR	
ļ	7440-50-8					NR	•
. [7439-89-6	Iron				NR	
	7439-92-1	Lead	· · · · · · · · · · · · · · · · · · ·			NR	
		Magnesium			•	NR	
		Manganese	/			NR	
ŀ	7439-97-6	Mercury	0.16 🗸	U		CV	
• [7440-02-0	Nickel				NR	
	7440-09-7	Potassium			·	NR	
ſ	7782-49-2	Selenium				NR	
Ţ	7440-22-4	Silver				NR	
Γ	7440-23-5	Sodium			;	NR	
Γ	7440-28-0	Thallium				NR	
. [7440-62-2	Vanadium				NR	
ļ.	7440-66-6	Zinc				NR	
T	57-12-5	Cyanide				NR	
, ,		- 					•
1	- 						
		- :					
or Before	: BROWN	Clarity	Before:		Texture: <u>N</u>	ÆDIUM_	11/21/
or After:	YELLOW	Clarity	After:		Artifacts:		11/21
					ATTITACES.	····	
mments:	* 1						

IA-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE N	

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047							JAA71
	-	Case No.: <u>3782</u>				o.: MJAA56	5
	oil/water) SOIL			-	Z5072-17		
Level: (lov	v/med) LOW		Date Re	ceived: 0	9/24/2008		
% Solids <u>:</u>	72.2						
					•		
Concentrat	ion Units (ug/L o	or mg/kg dry wei	ght <u>): MG/KG</u>	<u> </u>			
	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5					NR	
	7440-36-0	Antimony			<u> </u>	NR	
	7440-38-2					NR	
	7440-39-3					NR	
		Beryllium				NR	
	7440-43-9	Cadmium				NR	
	7440-70-2					NR	
	7440-47-3					NR	-
	7440-48-4					NR	
	7440-50-8					NR	
	7439-89-6					NR	
	7439-92-1					NR	
		Magnesium		<u> </u>		NR	
		Manganese		- 1		NR	
	7439-97-6		0.14 √	U		CV	
	7440-02-0					NR	
		Potassium			· ·	NR	
,	7782-49-2		· · · · · · · · · · · · · · · · · · ·	•		NR.	* * * * *
:	7440-22-4		*			NR	
	7440-23-5		· · · · · · · · · · · · · · · · · · ·			NR	
	7440-28-0					NR	
		Vanadium				NR	
	7440-66-6					NR	
	57-12-5	Cyanide				NR	
-							
. [•
olor Befor	e <u>: BROWN</u>	Clarity	y Before:		Texture: M	EDIUM	- -
olor After:	YELLOW	Clarity	After:		Artifacts:	<u>: : : : : : : : : : : : : : : : : : : </u>	11/2:/0
omments:		-	•			-	- r ,
-		· · · · · · · · · · · · · · · · · · ·					
							<u> </u>

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA	SAMP	LE NO
-----	------	-------

			MJAA'	72
Lab Name CHEMTECH CONSULTING GROUP	Contract: EPW06047	L_		
Lab Code: <u>CHEM</u> Case No.: <u>37825</u>	NRAS No.:	SDG No.:	MJAA56	
Matrix: (soil/water) SOIL	Lab Sample ID: Z5072-18		·	
Level: (low/med)_LOW	Date Received: 09/24/200	8	· · · · · · · · · · · · · · · · · · ·	
% Solids: 80.8 /				
Concentration Units (ug/L or mg/kg dry weight): M	G/KG			

CAS No.	Analyte	Concentration	С	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
74463364	/wseric				NF.
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium			•	NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper		•		NR.
7439-89-6	Iron .				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese	/	-	1	NR
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
57-12-5	Cyanide				NR

11/21/08
-

Clarity Before:_

Clarity After:

Color Before: BROWN

Color After: YELLOW

Comments:

IA-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

rix: (soi	l/water) SOIL		Lab Sam	mia ID	v 75072.	10			•
		•	•			-			
el: (low	med) LOW	· · · · · · · · · · · · · · · · · · ·	Date Red	ceived:	09/24/20	008			
olids <u>: 4</u>	7.3								
centratio	on Units (ug/L o	or mg/kg dry weig	ht): MG/KG						
	CAS No.	Analyte	Concentration	С		Q	М		
	7429-90-5	Aluminum			1	 	NR		
ľ		Antimony		 	-		NR	•	
	7440-38-2			<u> </u>	:		NT.		
-	7440-39-3			i —	Ť	<u> </u>	NR		
1	7440-41-7				1		NR		
Ī	7440-43-9				 		NR		
	7440-70-2	Calcium	· · · · · · · · · · · · · · · · · · ·				NR		
- [7440-47-3	Chromium			1		NR		
	7440-48-4	Cobalt				·	NR		
· [7440-50-8	Copper	*****				NR	,	
Γ	7439-89-6			. ,			NR		
Γ	7439-92-1	Lead			1 .		NR		
Γ	7439-95-4	Magnesium					NR		
Γ	7439-96+5	Manganese					NR		
	7439-97-6	Mercury	0.12√	Ţ	Q		CV	LORQL	> M
	7440-02-0	Nickel			2211/24	lo X	NR	- Dxx f	7 1-1.
. [7440-09-7	Potassium					NR		
	7782-49-2						NR		
. [7440-22-4	Silver					NR		
. L	7440-23-5	Sodium					NR		
. [7440-28-0	Thaliium					NR		
	7440-62-2	Vanadium					NR		
	7440-66-6						NR		
	57-12-5	Cyanide					NR.		
				i			<u> </u>		
	BROWN		Before:			Texture: <u>M</u> Artifacts:_		5,1/2	1/08

	•		USEPA - CLI	•			
		אוחשר	IA-IN BANIC ANALYSIS I	ים בוס	or.	EPA SA	MPLE NO.
		INOIC	INITIC NIAND I SIS I	ATA SHE	51	МЈ	AAF6
Lab Nam	e CHEMTECH C	ONSULTING G	ROUP Contract: E	PW06047			
Lab Code	:: <u>CHEM</u>	Case No.: <u>378</u>	25 NRAS No.:		SDG N	lo.: MJAA56	
Matrix: (s	soil/water) SOIL		Lab Sar	nple ID <u>: <i>Z5</i></u>	072-20	•	
Level: (lo	w/med) LOW		nate B	ceived: 09/	24/2008		
	/ /		Dan	2001 VOLI <u>. U<i>31</i>.</u>	24/2008		- .
% Solids <u>:</u>	81.5 ✓						
Concentre	tion Units (ug/L		-NA MOREO			,	
Concomi	mon Onus (ugil)	or nigrkg dry wer	git): MG/KG	 .	•		•
	CAS No.	Analyte	Concentration	. C	Q	М	
		Aluminum				NR	
	7440-36-0	Antimony	-			NP.	
	7440-31-2	Arsenic				137.	
	7440-39-3	Barium				NR	
	7440-41-7	Beryllium				NR	
	7440-43-9	Cadmium				NR	
	7440-70-2	Calcium			·	NR	
	7440-47-3	Chromium				NR	
	7440-48-4	Cobalt	·	,		NR	
	7440-50-8	Copper				NR	
	7439-89-6	Iron				NR	
• .	7439-92-1	Lead		1		NR	
	7439-95-4	Magnesium				NR	•
	7439-96-5	Manganese				NR	
	7439-97-6	Mercury	0.12	V UTI		CV	
	7440-02-0	Nickel			-11/21/08	NR	-
	7440-09-7	Potassium		1 135	11/2/10/8	NR	
	7782-49-2	Selenium	<u> </u>	 		NR	
	7440-22-4	Silver		 		NR	•
	**	Sodium		 		NR	
	7440-28-0	Thallium	······································			NR	
•	7440-62-2	Vanadium			_ ·	NR	
	7440-66-6					NR NR	
	57-12-5	Cyanide				NR NR	
		*				1417	4

Color Before: BROWN	Clarity Be	fore:		Texture: ME	DIUM	
Color After: YELLOW	Clarity Afi	er:	<u> </u>	Artifacts:		
Comments:			* 1			
	<u></u>					

7440-22-4 Silvei 7440-23-5 Sodium 7440-28-0 Thallium 7440-62-2 Vanadium 7440-66-6 Zinc 57-12-5 Cyanide



international Specialists in the Environment

720 Third Avenue, Suite 1700, Seattle, WA 98104 Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE:

October 20, 2008

TO:

Mark Woodke, Project Manager, E & E, Seattle, Washington

FROM:

David Ikeda, Chemist, E & E, Seattle, Washington

SUBJ:

Inorganic Data Summary Check, Tuluksak River Site Inspection,

Tuluksak, Alaska

REF:

TDD: 08-02-0007

PAN: 002233.0324.01SI

The data quality assurance summary check of 20 soil samples collected from the Tuluksak River in Tuluksak, Alaska has been completed. Inorganic analyses (EPA CLP SOW ILM05.4) were performed by Chemtech, Mountainside, New Jersey.

The samples were numbered:

MJAA55	MJAA60	MJAA65	MJAA70
MJAA56	MJAA61	MJAA66	MJAA71
MJAA57	MJAA62	MJAA67	MJAA72
MJAA58	MJAA63	MJAA68	MJAA83
MJAA59	MJAA64	MJAA69	MJAAF6

No discrepancies were noted. The secondary reviewer added "Q" bias qualifiers to positive sample results less than the contract required detection limit. For "Q" bias results, the secondary reviewer removed any qualifiers that the primary reviewer may have added.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 10

1200 Sixth Avenue, Suite 900 Seattle, Washington 98101

October 16, 2008

Reply To

Attn. Of: OEA-095

MEMORANDUM

SUBJECT: Data Validation for Tuluksak River Site Inspection,

Case# 37825, SDG: MJAA55, Inorganic Analysis

FROM: Donald Matheny, Chemist

Environmental Services Unit, OEA

Environmental Services Unit, OEA

TO: Brandon Perkins, Site Assessment Manager

Office of Environmental Cleanup (ECL-112)

CC: Renee Nordeen, Ecology & Environment

The data validation of inorganic analyses for the above sample set is complete. Twenty (20) soil/sediment samples were analyzed for total elements by Chemtech, Mountainside, NJ. Sample numbers for this delivery group are as follows:

MJAA55	MJAA56	MJAA57	MJAA58	MJAA59		MJAA60	MJAA61
MJAA62	MJAA63	MJAA64	MJAA65	MJAA66		MJAA67	MJAA68
MJAA69	MJAA70	MJAA71	MJAA72	E8AALM	٠	MJAAF6	

DATA QUALIFICATIONS

The following comments refer to the lab's performance in meeting the specifications outlined in the "CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILM05.4", the "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" and the judgment of the reviewer. The comments presented herein are based on the information provided for the review.

TIMELINESS - Acceptable

The holding time from the date of collection to the date of digestion and analyses were met for all elements (180 days). Samples were collected on 9/16/08 and 9/17/08. ICP-AES analysis was conducted on 10/10/08.

INSTRUMENT CALIBRATION/VERIFICTION - Acceptable

For ICP-AES analysis, instrument calibration was performed in accordance with method requirements. Recoveries for instrument verification standards (92-109%) met the frequency (10%) and recovery (90-110%).

Quantitation verification standards met both the frequency and recovery criteria for all elements.

ICP-AES INTERFERENCE CHECK SAMPLE (ICS) - Acceptable

An ICS was analyzed at the required frequency for each analytical run. ICS recoveries met the recovery criterion (80-120% or \pm 2xCRQL) for all elements.

LABORATORY CONTROL SAMPLES (LCS) - Acceptable

An aqueous Laboratory Control Sample was digested and analyzed. Percent recoveries (98-106%) were within the control limits (80-120%).

BLANKS - Acceptable

Preparation and instrument control blanks were prepared and analyzed in accordance with method requirements. Blanks were not detected at concentrations that impact sample values.

MATRIX SPIKE ANALYSIS

A matrix spike was analyzed for sample MJAAF6. Percent recoveries (94-119%) met the criterion (75-125%) for all elements with the exception of silver (49%). Silver data were qualified (JL or UJL) and may be biased low.

DUPLICATE SAMPLE ANALYSIS - Acceptable

A duplicate sample was analyzed for sample MJAAF6. Relative percent differences (\leq 1%) met the control limits (\pm 35% or \pm 2xCRQL) for soils.

ICP-AES SERIAL DILUTION

A five-fold serial dilution was analyzed for sample MJAAF6. Percent differences (\leq 11%) were within the 1% allowable variance from the acceptance criteria (\leq 10%) for all applicable elements with the exception of zinc (15%). Zinc data were qualified (JL) and may be biased low.

ASSESSMENT SUMMARY

The following is a summary of qualified data:

Silver data were qualified (JL or UJL) due to a low matrix spike recovery. Silver values may be biased low.

Zinc data were qualified (JL) due to a high percent difference in the serial dilution result. Values for zinc may be biased low.

DATA QUALIFIERS

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- J The associated value is an estimated quantity.
- R The data are unusable. The analyte may or may not be present in the sample.
- UJ The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

PROJECT SPECIFIC DATA QUALIFIERS:

- L Low bias.
- H High bias.
- K Unknown Bias.
- Q Detected concentration is below the method reporting limit / Contract Required Quantitation Limit, but is above the method detection limit.

EPA SAMPLE NO

			ANIC ANALYSIS I			MJA	A55
ab Name	СНЕМТЕСН С	ONSULTING GR	OUP Contract: El	PW06047			`
ab Code:	СНЕМ	Case No.: <u>3782</u>	5 NRAS No.:		SDG No.:	MJAA55	
latrix: (so	il/water <u>)_SOIL_</u>		Lab Sar	mple ID <u>: Z</u>	4536-01		
evel: (low	/med) LOW	· · · · · · · · · · · · · · · · · · ·	Date Re	eceived <u>: 09</u>	/24/2008		
Solids:	49.0	r	•				
oncentrat	ion Units (ug/L o	or mg/kg dry weig	ht): MG/KG				
	CAS No.	Analyte	Concentration	C	Q	М	
	7429-90-5	Aluminum	13400			P	
1	7440-36-0		1.2	JQ		P	
٠.	7440-38-2		28.1		· · · · · · · · · · · · · · · · · · ·	P	
-	7440-39-3		163			P	•
		Beryllium	0.34	JQ	 	P	
	7440-43-9		2.3			P	*
	7440-70-2		2890	 	<u> </u>	P	
	7440-47-3		22.4	·		P	
	7440-48-4		10.6			P	
	7440-50-8		22.1		· · · · ·	P	
	7439-89-6		41300		-上	P	
•	7439-92-1	Lead	8.2			P	
		Magnesium	4030			P	
	7439-96-5	Manganese	575	1	•	P	
	7439-97-6				· · · · · · · · · · · · · · · · · · ·	NR	
	7440-02-0	Nickel	21.4			P	
	7440-09-7	Potassium	585	JQ		P	
	7782-49-2	Selenium	7.1	U		P	
	7440-22-4	Silver	2.0	- U	H UJL	. P	
-	7440-23-5	Sodium .	177	JQ		P	70
	7440-28-0	Thallium	5.1	Ū		P	2000 208
	7440-62-2	Vanadium	40.5		•	P	20 00
	7440-66-6	Zinc	70.9		チェー	P	et.
	57-12-5	Cyanide				NR	
ľ							•
			,				Del
	,					<u> </u>	
lor Befor	e <u>: BROWN</u>	Clarity	Before:		Texture: <u>ME</u>	D I UM	Dr. 10-16-
lor After:	YELLOW	Clarity	After:		Artifacts:		
mments:		·• .					

EPA	SA	MPI	Æ	NO.
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ab Name_	СНЕМТЕСН С	ONSULTING GR	OUP Contract: E	PW06047			
ab Code:	СНЕМ	Case No.: 3782	5 NRAS No.:		SDG No.:	MJAA55	
atrix: (so	il/water <u>) SOIL</u>	· ·	Lab Sa	mple ID <u>: Z</u>	4536-02	,	
vel: (low	/med <u>) LOW</u>	<u> </u>	Date Re	eceived <u>: 09</u>	/24/2008		
Solids:	50.0	•				•	
ncentrati	ion Units (ug/L	or mg/kg dry weig	ht <u>): MG/KG</u>				
	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5	Aluminum	15100		·	P	
		Antimony	1.2	Jα		P	
•	7440-38-2	Arsenic	27.0		··	P	
. ,	7440-39-3		165		 -	P	
	7440-41-7		. 0.37	JQ		P	1
	7440-43-9	Cadmium	2.7			P	
-	7440-70-2		3780			P	
	7440-47-3		26.5			P	
	- 7440-48-4	Cobalt	11.4			P	
	7440-50-8	Copper	21.2			P	•
	7439-89-6	Iron	46300		- E -	P	
	7439-92-1	Lead	7.6			P	
		Magnesium	5170			P	
ļ	7439-96-5	Manganese	443			P	
ļ	7439-97-6	Mercury			· · · · · · · · · · · · · · · · · · ·	NR.	
	7440-02-0	Nickel	26.5			P	
1	7.440-09-7	Potassium	.660	JQ		P	
ļ	7782-49-2	Selenium /	7.0	U	· · · · · · · · · · · · · · · · · · ·	P	i.
	7440-22-4	Silver	. 2.0	U	してい 米	Ρ.	
. -	7440-23-5	Sodium	216	Jo		P	(T)
·.	7440-28-0	THUHHUH	5.0	U		P	200008
Ļ	7440-62-2	Vanadium	45.4			P	
. [7440-66-6	Zinc	77.9		モエ	P	•
- -	57-12-5	Cyanide		<u> </u>		NR	
]_	·						i i
L		,		<u> </u>	<u> </u>		DI
r Before	: BROWN	Clarity	Before:		Texture: MEI	DIUM	10-16-
or After:_	YELLOW	Clarity	After:		Artifacts:	·	
ments:	100						*

IA-IN

EPA	\sim	Δ	λÆ	ΤŒ	F	N	\cap
L_{EM}	ے.	ጧ	IVI	ட	ıĿ	JV	١

Name_	CHEMTECH CO	ONSULTING GROUP	Contract: EF	W06047	7 · L	 -	
Code:	СНЕМ	Case No.: <u>37825</u>	_ NRAS No.:	<u>. </u>	SDG No	.: MJAA5	5
trix: (so	il/water <u>) SOIL</u>		Lab Sar	nple ID <u>:</u>	Z4536-03		<u>.</u>
el: (low	/med) LOW		Date Re	ceived <u>: (</u>	09/24/2008		
olids <u>: 7</u>	78.5 ·	·	•	•	. • •		
centrati	on Units (ug/L o	or mg/kg dry weight <u>):</u>	MG/KG		·		•
	CAS No.	Analyte (Concentration	C	Q	М	
	7429-90-5		14000	1		· P	
		Antimony	1.4	JQ	· · · · · · · · · · · · · · · · · · ·	P	
	7440-38-2	Arsenic	12.3	+	· · · · · · · · · · · · · · · · · · ·	P	•
	7440-39-3	<u> </u>	94.7	+	`	P	
	7440-41-7		0.40	JQ		P	•
	7440-43-9		1.9	+		P	
	7440-70-2	Calcium	2900			P	•
İ	7440-47-3	Chromium	26.3	1.		P	
	7440-48-4	Cobalt	15.1			P	
	7440-50-8	Copper	26.4			P	
	7439-89-6	Iron	32600		-E-	P	
Ī	7439-92-1	Lead	7.1			P	
Ī	7439-95-4	Magnesium	6490			P	
. [7439-96-5	Manganese	939			P	•
`[7439-97-6	Mercury				NR	
	7440-02-0	Nickel	.32.2		-	P	
. [7440-09-7	Potassium	578	JQ		P	
. [7782-49-2	Selenium	4.5	U I		P	•
: [7440-22-4	Silver	0.18	J-	JQ H JE	Р	•
,	7440-23-5	Sodium	. 165 .	JQ		P	<u></u>
320	7440-28-0	Thallium	3.2	U ·		P	D .
1	7440-62-2	Vanadium	50.1			P	20000
	7440-66-6	Zinc	77.6	 	<u></u> + JL	P	V
•	57-12-5	Cyanide	<u> </u>			NR	
				 -			Dr
L				<u>.ll</u>			10-10
	: BROWN	Clarity Bef	_		Texture: M	EDIUM	_ 10/10
r After:	YELLOW	Clarity Aft	cr:		Artifacts:		_
ments:							
							<u> </u>

EPA:	SA	MΡ	LE	N(Э
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ah Name i	опемаесь с	ONIGITI TIMA A	מנזסמ	Contract: E	DW06047		MJ.	AA58	}
au inailie <u>.</u>	CHEMIECH C	<u>ONSULTING G</u>	KUUP	Contract; E	<u>PWU6U47</u>				•
ab Code:	CHEM	Case No.: <u>378</u>	25	NRAS No.:	·	SDG No.	.: MJAA55		•
1atrix: (soi	I/water <u>) SOIL</u>		•	Lab Sa	mple ID <u>: Z</u>	4536-04			
evel: (low	/med) LOW_	· .		Date R	eceived <u>: 09</u>	/24/2008			
Solids <u>: 5</u>	2.1		• .			•			
oncentrati	on Units (ng/L o	or mg/kg dry we	ight <u>): M</u>	G/KG	·,	•	•	•	•
	CAS No.	Analyte	Co	ncentration	С	Q	М		
İ	7429-90-5	Aluminum		18400			Р	-3	
İ	7440-36-0			1.2	JQ		P		
ļ	7440-38-2	Arsenic	9E)	17.8			P		
ľ	7440-39-3	Barium	1 .	161			P		
	7440-41-7	Beryllium	·	0.38	JQ		P		
Ī	7440-43-9	Cadmium	ė	2.2			P	-	
[7440-70 - 2	Calcium		3500		·	P		
[7440-47-3	Chromium	<u> </u>	25.1			P	1	
Ī	. 7440-48-4	Cobalt	· ·	12.3			P		
[7440-50 - 8	Copper		23.3			P		
Ī	7439-89-6	Iron		39300		-E-	P	-	
. [7439-92-1	Lead		8.4			P		
. [7439-95-4	Magnesium		5850		•	P		
· F	7439-96-5	Manganese	ĺ	519		-	P		
Γ	7439-97-6	Mercury				7 .	NR		
. [7440-02-0	Nickel		21.6			P		
· · [7440-09-7	Potassium		560	JQ		P	•	,
· [7782-49-2	Selenium	100	6.6	U		P		
Γ	7440-22-4	Silver		1.9	4	A MIL	P		
·	7440-23-5	Sodium		293	JO		. P		
2 E	7440-28-0	Thallium	rl .	4.7	U		P	The same of the sa	•
	7440-62-2	Vanadium		57.3		<u> </u>	P	20 000	08
19g [7440-66-6	Zinc		72.7		+ 5∟	P	20 00	
· F	57-12-5	Cyanide					NR		•
					i. i.				
				· · · · · · · · · · · · · · · · · · ·			 	DM	
. <u> </u>	-						.ll	10-1	ه سرعا
lor Before	BROWN	Clarit	y Before	;:		Texture: ME	DIUM	(5)	
lor After:_	YELLOW	Clarit	y After:_		 .	Artifacts:			
mments:							,		
			•	,	· - ·				
		····					· · · · · · · · · · · · · · · · · · ·	<u> </u>	

1A-TN

EPA SAMPLE NO

		INORO	GANIC ANALYSIS D	ATA SHE	ET -	EFA SAIV	
					,51	MJA	A59
ab Name	CHEMTECH CO	ONSULTING G	ROUP Contract: El	WU6047			
.ab Code: .	СНЕМ	Case No.: <u>378</u>	25 NRAS No.:		SDG No.:	MJAA55	
fatrix: (so	l/water <u>)_SOIL</u>		Lab Sar	nple ID <u>: Z</u>	4536-05		-
.evel: (low	/med <u>) LOW</u>		Date Re	ceived <u>: 09</u>	/24/2008		<u>.</u>
á Solids <u>: é</u>	57.7						-
Concentrati	on Units (ug/L o	or mg/kg dry we	ight <u>): MG/KG</u>				
	CAS No.	Analyte	Concentration	C	Q	М	
	7429-90-5	Aluminum	13700	T		I P	
	7440-36-0		1.3	JQ		P	*
	7440-38-2		13.6			P	
1	7440-39-3		134	† †	 	P	
	7440-41-7		0.28	JQ	· · · · · · · · · · · · · · · · · · ·	P	
	7440-43-9		1.8	 		P	
	7440-70-2	1	2880	1 1		P	f
	7440-47-3		18.8			P	
ļ	7440-48-4		9.4	<u> </u>		P	
i	7440-50-8	Соррег	17.0		,	P	
	7439-89-6		34100			P	
	7439-92-1	Lead	5.9			P	•
. 1	7439-95-4	Magnesium	5060			P	
Ī	7439-96-5		401			P	•
ľ	7439-97-6		-	<u> </u>		NR	
Ī	7440-02-0	Nickel	, 16.4			P	
Ī	7440-09-7	Potassium	529	JQ	1	P	
·	7782-49-2		5.1	Ü	· · · · · · · · · · · · · · · · · · ·	P	•
. [7440-22-4	Silver	I.4	H-	H NIL	P	
_	7440-23-5	Sodium	193	JQ		P	
′ / [7440-28-0	Ţhallium	3.6	Ū		P	200000
. 11	7440-62-2	Vanadium .	45.3			P	00 DC.
-	· 7440-66-6	Zinc	54.1		モ JL	P	ν
Ī	57-12-5	Cyanide	٠.			NR	
. [***		<u> </u>			TOM
				<u></u>	· · · · · · · · · · · · · · · · · · ·		٠ ٠٠٠
olor Before	: BROWN	Clari	ry Before:		Texture: <u>'ME</u> l	DTUM	ما ۱ – ۱۵
olor After:	YELLOW	Clarit	y After:	<u> </u>	Artifacts:	·	
omments:	4.5		•				r

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Lab Name_	СНЕМТЕСН С	ONSULTING GI	ROUP Contract: E	PW06047_	<u>. </u>	MJ	AA60
Lab Code: _	CHEM	Case No.: <u>3783</u>	25 NRAS No.:		SDG No.:	MJAA55	
Matrix: (so	il/water <u>) SOIL</u>		Lab Sa	mple ID <u>: Z</u>	4536-06		_
Level: (low	/med <u>) LOW</u>	· .	Date R	eceived <u>: 09</u>	/24/2008		-
% Solids <u>: 6</u>	0.5						
Concentrati	on Units (ug/L o	or mg/kg dry wei	ght <u>): MG/KG</u>			•	
, ,	CAS No.	Analyte :	Concentration	С	Q	М	•
	7429-90-5	Aluminum	16300		· · · · · · · · · · · · · · · · · · ·	P	
	7440-36-0		0.96	JΩ		P	
. i	7440-38-2	Arsenic	8.7			P	•
	7440-39-3		104			P	
•	7440-41-7	Beryllium	0.31	JQ		P	
	7440-43-9		1.8		a september 1	P	
	7440-70-2	Calcium	3040			· P	
	7440-47-3		26.1			P	·
. [7440-48-4	Cobalt	11.8			P	
[7440-50-8	Copper	18.5			P	•
	7439-89-6		33400		مسطر	P	* * * * * * * * * * * * * * * * * * * *
[7439-92-1	Lead	6.0			P	
	7439-95-4		7010			P	
	7439-96-5	Manganese	395			P	4.
	7439-97-6	Mercury				NR	•
[]	7440-02-0	Nickel	26.2	-		P	
4.5	7440-09-7	Potassium	596	JQ		Р	•
	7782-49-2	Selenium -	<i>~</i> 5.7	U		P	
	7440-22-4	Silver	1.6	14	TEN #	Р	1
. [7440-23-5	Sodium	181	JQ		P	20 OCT 08
	7440-28-0	1 1141114111	4.1	U		P	OCT O
· . [7440-62-2	Vanadium	50.9			P	<i>p</i>
. [7440-66-6	Zinc	72.0	•	サーブレ	P	e .
·	57-12-5	Cyanide	. <u> </u>	<u> </u>		NR	
-							DM
Color Before	: BROWN	Clarit	y Before:		Texture: MEI		70-16-0
Color After:			y After:		Artifacts:		e ·
				 ·			
Comments:							<u>. </u>
	-		<u> </u>				
		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		 .		

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		INORG	ANIC ANALYSIS D	ATA SHE	ET		
						MJA	A61
Lab Name	CHEMTECH C	ONSULTING GE	ROUP Contract: El	PW06047	<u></u> .		
Lab Code:	СНЕМ	Case No.: <u>3782</u>	NRAS No.:		SDG No.:	MJAA55	
Matrix: (sc	oil/water <u>) SOIL</u>		. Lab Sar	nple ID <u>: Z</u>	4536-07		·
Level: flow	v/med <u>)_LOW</u>		Date Re	ceived: 09	/24/2008		•
	*						-
% Solids <u>:</u>	/5.0	•			•		
Concentrat	ion Units (ug/L o	or mg/kg dry wei	ght <u>): MG/KG</u>				
							
	CAS No.	Analyte	Concentration	C .	Q	M	
	7429-90-5	Aluminum	13300	Ţ <u> </u>		P	
	7440-36-0	Antimony	0.84	JQ		P	÷
	7440-38-2	Arsenic	7.3	1. 1		P	
	7440-39-3	Barium	76.4			P	
	7440-41-7	Beryllium	0.26	JQ		P	•
•	7440-43-9		1.5			P	
	7440-70-2		2390			P	
	7440-47-3		21.2			P	
	7440-48-4	Cobalt	10.9	 		P	•
	7440-50-8	Copper	16.7			P	
	7439-89-6		27700	 	E	P	
	7439-92-1	Lead	4.4	1 1		P	•
•	7439-95-4		6450			P	
	7439-96-5	Manganese	537	 	,	P	
	7439-97-6	Mercury		 		NR	20 000 08
	7440-02-0	Nickel	23.0	 	· · · · · · · · · · · · · · · · · · ·	P	OC.
	7440-09-7	Potassium	499	JQ		P	20
	7782-49-2	Selenium	4.7	U	**	P	
	7440-22-4		1,3	1 15	A UIL	P	•
• •	7440-23-5		124	JQ	- CLIL	P	•
,	7440-28-0		3.3	U		P	
,	7440-62-2	Vanadium	44.7	 		P	•
	7440-66-6	Zinc	61.6	 	士 JL	P	• •
	57-12-5	Cyanide	01.0	 	<u> </u>	NR	
	57-12-5	Cymnide	 	 		14,12	
•		-	* * *	T			DM.
		م ت		·····			10-16-08
Color Befor	e <u>: BROWN</u>	Clarit	y Before:		Texture: <u>ME</u>	<u>DIUM</u>	(6
Color After:	YELLOW	Clarit	y After:	<u> </u>	Artifacts:		
Comments:	·				•	•	
<u>. </u>					,		····
			·				<u> </u>
		<u> 1 </u>					

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EFA	ΔA	IVI I'I	. F.	INL)

		INORG	ANIC ANALYSIS D	ATA SH	ERT -		
ah Name	сиемтесы с	ONSULTING GI				М.	JAA62
			•	* W UBU4 /			
ab Code:	CHEM	Case No.: 3782	25 NRAS No.:		SDG No.	: MJAA5:	5
latrix: (so	il/water <u>) SOIL</u>	•	Lab Sar	nple ID <u>: :</u>	Z4536-08		
evel: (low	/med) LOW		Date Re	ceived <u>: 0</u>	9/24/2008		
Solids: 7	71.9				,		
oncentrati	on Units (ug/L o	or mg/kg dry wei	ght <u>): MG/KG</u>			•	
	CAS No.	Analyte	Concentration	Ċ	Q	M	
	7429-90-5	Aluminum	13900	7 7	<u> </u>		
	7440-36-0	Antimony	1.1	JQ		P	
	7440-38-2	Arsenic	8.7	7 02		P	
	7440-39-3	Barium	85.8	 	1	P	
'	7440-41-7	Beryllium	0.25	JQ		P	·
ĺ	7440-43-9		1.5		, A. T. T	P	
	7440-70-2	Calcium	2420	1		P	
	7440-47-3		20.3			P	•
f	7440-48-4	Cobalt	10.9	 		P	
· · ·	7440-50-8	Copper	18.3	 	·	P	,
j	7439-89-6	Iron	27100	 	-E-	P	
	7439-92-1	Lead	4.6		<u> </u>	P	4
	7439-95-4		6600	 		P	
. [7439-96-5	Manganese	715			P	•
-	7439-97-6	Mercury		 		NR	
Ī	7440-02-0	Nickel	20.6	 		P	
	7440-09-7	Potassium	603	JQ	· · · · · · · · · · · · · · · · · · ·	P	(\)
	7782-49-2	Selenium	4.9	Ū		P .	2000
Ī	7440-22-4	Silver	1.4	'- U -	ILN 44	P	\mathcal{V}^{-}
	7440-23-5	Sodium	· I15	JQ		P	
ſ	7440-28-0	Thallium	3.5	U	*	P .	
[7440-62-2	Vanadium	50.2			P	
· [7440-66-6	Zinc.	58.2		F JL	P	
· [57-12-5	Cyanide		· · · ·		NR	
Γ							
Ţ.					· · ·		<u> </u>
r Before	: BROWN	Clarit	y Before:		Texture: MF	ЕПЛМ	- 10-(h-
	YELLOW		y After:		Artifacts:		_ (0 -
,					·,		- ,
nments:							
					<u> </u>		

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

ab Name_	CHEMTECH CO	ONSULTING GE	ROUP Contract: E	EPW06047		· .	
аъ Code:	CHEM	Case No.: <u>3782</u>	25 NRAS No.	:	SDG No.:	MJAA55	
Aatrix: (so	il/water <u>) SOIL</u>		Lab Sa	ımple ID <u>: Z4</u>	536-09		
Level: (low	/med) LOW		Date R	Leceived <u>: 09/2</u>	24/2008		
√ Solids <u>:</u>	75.0	•					
		/1i	alth MC/KC			,	
Loncentrati	ion Units (ug/L c	or mg/kg dry wei	gntj: MG/KG				
	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5	Aluminum	11400	T I	· · · · · · · · · · · · · · · · · · ·	P	1
	7440-36-0		0.72	JQ.		P	
	7440-38-2		7.3			P	
	7440-39-3		62.7			P	
	7440-41-7		0.21	JQ		P	
	7440-43-9		1.2	- i		P	•
	7440-70-2		2230			P	
	7440-47-3		15.8			P	
	. 7440-48-4		9.3			P	
-	7440-50-8	Copper	17.4			P	
	7439-89-6	Iron	23500		- 	P	
	7439-92-1	Lead	3.8			P	
	7439-95-4	Magnesium	6100			P	-
	7439-96-5		536			P	
	7439-97-6	Mercury				NR	
	7440-02-0	Nickel	16.1			P	
	7440-09-7	Potassium	507	JQ.		P	7
	7782-49-2	Selenium	4.7	Ū		P	
	7440-22-4	Silver	. 1.3	U	₩ UZL	P	2000
İ	7440-23-5	Sodium	178	JQ		P	7.5
i	7440-28-0	Thallium	3.3	Ū	•	P	
	7440-62-2	Vanadium	44.7			P	•
	7440-66-6	Zinc	50.0		まょし	P	
	57-12-5	Cyanide				NR	
ļ							
,	-						1
r					- ` -		10-
lor Befor	e: BROWN	Clarit	y Before:		Texture: ME	DIUM	10-
olor After:	YELLOW .	Clarit	y After:		Artifacts:		1
onments:							

EPA	SA	MP	LF.	NO

.ab Code: <u>CHEM</u> Aatrix: (soil/wate: .evel: (low/med) % Solids: 73.1 Concentration Uni CA 74 74 74 74 74 74 74 74 74 7	n) SOIL	ONSULTING GI Case No.: 378: or mg/kg dry wei Analyte Aluminum	Date Reght): MG/KG Concentration	PW06047 inple ID <u>: Z4</u> ceived <u>: 09/</u>	SDG No.:	·	AA64
.ab Code: <u>CHEM</u> Aatrix: (soil/wate: .evel: (low/med) % Solids: 73.1 Concentration Uni CA 74 74 74 74 74 74 74 74 74 7	ts (ug/L on 1429-90-5 140-38-2	Case No.: 3782 or mg/kg dry wei Analyte Aluminum	25 NRAS No.: Lab Sar Date Re ght): MG/KG Concentration	nple ID <u>: Z4</u> ceived <u>: 09/</u>	536-10	MJAA55	
Astrix: (soil/water evel: (low/med) Solids: 73.1 Oncentration Uni CA 74 74 74 74 74 74 74 74 74 7	ts (ug/L of 1429-90-5 140-36-0 140-38-2	or mg/kg dry wei Analyte Aluminum	Lab San Date Re ght): MG/KG Concentration	nple ID <u>: Z4</u> ceived <u>: 09/</u>	536-10	MJAA55	- -
cvel: (low/med) Solids: 73.1 CA 74 74 74 74 74 74 74 74 74	LOW ts (ug/L out to 129-90-5 140-36-0 140-38-2	or mg/kg dry wei Analyte Aluminum	Date Reght): MG/KG Concentration	ceived <u>: 09/</u>			_
Solids: 73.1 CA 74 74 74 74 74 74 74 74 74 7	ts (ug/L o	Analyte Aluminum	ght): MG/KG Concentration	<u> </u>	<u>24/2008</u> .		_
CA 74 74 74 74 74 74 74 74 74 74 74	AS No. 429-90-5 440-36-0 440-38-2	Analyte Aluminum	Concentration	<u> </u>	•		-
CA 74 74 74 74 74 74 74 74 74 74	AS No. 429-90-5 440-36-0 440-38-2	Analyte Aluminum	Concentration	<u></u>			•
CA 74 74 74 74 74 74 74 74 74 74	AS No. 429-90-5 440-36-0 440-38-2	Analyte Aluminum	Concentration				•
72 72 74 74 74 74 74 74 74	129-90-5 140-36-0 140-38-2	Aluminum		_			•
72 74 74 74 74 74 74 74 74	140-36 - 0 140-38-2			С	Q	M	
74 74 74 74 74 74 74 74	140-38-2		13200			P	
74 74 74 74 74 74 74		Antimony	1.0	10		P	
74 74 74 74 74 74	140-39-3		10.5			P	
74 74 74 74 74 74		Barium	98.5			P	
74 74 74 74 74		Beryllium	0.27	JQ		P	
74 74 74 74		Cadmium	1.4			P	
74 74 74	140-70-2		2720			P	
74 74	40-47-3	Chromium	. 16.4		**	P·	
74	40-48-4	Cobalt	10.8			P	
	40-50 - 8	Copper	17.7	1 7		P	
	39-89-6	Iron	25100			P	
74	39-92-1	Lead	4.2			P	
74	39-95-4	Magnesium	6370			P	
74	39-96-5	Manganese	505			P	
74	39-97-6	Mercury	-			NR	
. 74	40-02-0	Nickel	15,7			P	7
	40-09-7	Potassium	757			P	
. 77	82-49-2	Selenium	4.8	Ū		P	2000
7/1	40-22-4	Silver	1.4	¥	H UJL	P	
	40-23-5	Sodium	128	JQ		P	
	40-28-0		3.4	U		P	
	40-62-2	Vanadium	51.1			P	٠
		Zinc	51.9		まっずし	P	
	57-12-5	Cyanide				NR	
						1110	
r Before <u>: BRO</u>	-	•	y Before:	<u>.</u> .	Texture: ME	DIUM	Dr. 10-16
or After: <u>YELLC</u>	J V V	_ Clarity	y After:		Artifacts:		
nments:	,	•				•	

1A-IN

EPA	SA	MPI	F	NO

SOIL LOW s (ug/L of S No. 29-90-5 40-36-0 40-38-2 40-41-7 40-43-9 40-47-2 40-47-3 40-48-4 40-50-8	or mg/kg dry weight analyte Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	25 NRAS No.: _ Lab Sam Date Rec	W06047	SDG No.:	MJAA55 M P P P P P P P P P P P P P P P P P P	A65
SOIL LOW s (ug/L of S No. 29-90-5 40-36-0 40-38-2 40-41-7 40-43-9 40-47-2 40-47-3 40-48-4 40-50-8	r mg/kg dry weigen analyte Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	25 NRAS No.:	ceived: 09/2	536-11 24/2008	M P P P P P P P P P	- -
SOIL COW s (ug/L composition of the composition of	Analyte Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	Lab Sam Date Rec ght): MG/KG Concentration . 11200	C	536-11 24/2008	M P P P P P P P P P	
s (ug/L of S No. 29-90-5 40-36-0 40-38-2 40-41-7 40-43-9 40-47-3 40-48-4 40-50-8	Analyte Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	Date Recognition Concentration . 11200	C JQ	24/2008	P P P P P P	
s (ug/L of S No. 29-90-5 40-36-0 40-38-2 40-41-7 40-43-9 40-47-3 40-48-4 40-50-8	Analyte Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	ght); MG/KG Concentration . 11200	C		P P P P P P	
S No. 29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	Concentration . 11200 . 0.64 . 8.4 . 76.1 . 0.19 . 1.1 . 2510 . 14.2 . 8.6	JQ	Q	P P P P P P	
S No. 29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	Concentration . 11200 . 0.64 . 8.4 . 76.1 . 0.19 . 1.1 . 2510 . 14.2 . 8.6	JQ	Q	P P P P P P	
29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	0.64 8.4 76.1 0.19 1.1 2510 14.2 8.6	JQ	Q	P P P P P P	
40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	0.64 8.4 76.1 0.19 1.1 2510 14.2 8.6	•		P P P P P	
40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	0.64 8.4 76.1 0.19 1.1 2510 14.2 8.6	•		P P P P P	
40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt	8.4 76.1 0.19 1.1 2510 14.2 8.6	•		P P P P P	
40-39-3 40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Barium Beryllium Cadmium Calcium Chromium Cobalt	76.1 0.19 1.1 2510 14.2 8.6	16		P P P	
40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Beryllium Cadmium Calcium Chromium ·Cobalt	0.19 1.1 2510 14.2 8.6	JQ		P P P	
40-43-9 40-70-2 40-47-3 40-48-4 40-50-8	Cadmium Calcium Chromium Cobalt	1.1 2510 14.2 8.6			P P P	
40-70-2 40-47-3 40-48-4 40-50-8	Calcium Chromium ·Cobalt	2510 14.2 8.6			P.	
40-47-3 40-48-4 40-50-8	Chromium ·Cobalt	14.2 8.6			P	
10-48-4 10-50-8	·Cobalt	8.6				
10-50 - 8					1 2 1	100
		י ו.מו	1		P	
39-89-6		21200		<u>. E</u>	P	
39-92-1	Lead	3.8		· · · · · · · · · · · · · · · · · · ·	P	
	Magnesium	5360	1 - 1 -		P	
	Manganese	501			P	
	Mercury				NR	
		12.9			P	
			J Ø .		P	
			U		P	
			U	女 レエト		
						2000
			Ū		P	200
				······································	P	
	Zinc			+ JL	P	
	Cyanide				NR	
						<u></u>
I.			·			10-10
VN	Clarit	y Before:		Texture: ME	D I UM	10-10
)W	Clarit	y After:		Artifacts:	•	
			:			
·						
	0-09-7 32-49-2 0-22-4 0-23-5 0-28-0 0-62-2 0-66-6 7-12-5	0-62-2 Vanadium 0-66-6 Zinc 7-12-5 Cyanide WN Clarit	10-09-7 Potassium 616	10-09-7 Potassium 616 JQ 12-49-2 Selenium 4.3 U 10-22-4 Silver 1.2 U 10-23-5 Sodium 194 JQ 10-23-5 Sodium 3.1 U 10-62-2 Vanadium 43.9 0-66-6 Zinc 43.0 7-12-5 Cyanide	10-09-7 Potassium 1616 JQ 12-49-2 Selenium 4.3 U 14-22-4 Silver 1.2 U W U U U U U U U U	10-09-7 Potassium 11-2

IA-IN

EPA	SAMPLE	NO

		INOR	GANIC ANALYSIS	DATA SH	EET · r		IMPLE NO.
) Name	СНЕМТЕСН С	ONSULTING (GROUP Contract: 1	EPW06047		M.	JAA66
,							_
Code:	<u>CHEM</u>	Case No.: <u>37</u>	825 . NRAS No	.:	SDG No.	: MJAA5	5 ,
trix: (so	il/water <u>) SOIL</u>	- 10	Lab S	ample ID <u>: Z</u>	Z4536-12		
/el:-(low	/med <u>)_LOW</u>	· ·	Date I	Received <u>: 09</u>	9/24/2008		
olids:	59.2						
centrati	on Units (ug/L o	or mg/kg dry w	eight <u>): MG/KG</u>				
	CAS No.	Analyte	Concentration	C			,
				<u> </u>	Q	M	•
	7429-90-5		15500			Р	4 . '
	7440-36-0		1.0	10		P	
	7440-38-2		14.2			P	•
,	7440-39-3		121			P	
	7440-41-7		0.28	JQ	·	P	. "
	7440-43-9		1.6			P	
	744 0-70-2		3720			P	
i	7440-47-3		18.7			P	
	7440-48-4		13.5			P	•
ļ	7440-50-8	Copper	24.1			P	
	7439 - 89-6	Iron	30400			P	
L	7439-92-1	Lead	5.6			P	
		Magnesium	7680			P	•
Ĺ		Manganese	768			P	
	7439-97-6	Mercury	1.0			NR	
	7440-02-0	Nickel	17.4			P	
	7440-09- 7	Potassium	978			P	
	7782-49-2	Selenium	5.8	U	,	P	7
[7440-22-4	Silver ·	1.7	H-	光 アント	P	20 00
[7440-23-5	Sodium	161	JQ		P :	2D 00
•	7440-28-0	Thallium	* 4.1	U	:	P	-
Γ	7440-62-2	Vanadium	61.6			P	
_ ,· [7440-66-6	Zinc	64.3		⊕ JL	P	•
Γ	57-12-5	Cyanide				NR	
. [,						•
	· .						7~~
r Before	: BROWN	Clar	ity Before:		Texture: ME	DIUM	10-(p.
						- 101AI	
	YELLOW	Clar	ity After:		Artifacts:		
nents:		•					
			•				

EPA	QΔ	MPI	F	NΩ
$L_{1} \cap$	-2	TATE T	æ	INU.

		TNODG	1A-IN ANICANAI VSIS D	ига ата	FET	EFA SA	MPLE NO.
INORGANIC ANALYSIS DATA SHEET							IAA67
Lab Name_(СНЕМТЕСН СО	ONSULTING GR	OUP Contract: EF	W06047	· · · · · · · · · · · · · · · · · · ·	`L	
ab Code: _	СНЕМ	Case No.: <u>3782</u>	5 NRAS No.:	•	SDG N	o.: MJAA5:	5 .
latrix: (soi	l/water <u>) SOIL</u>		Lab Sar	nple ID <u>:</u>	Z4536-13		
evel: (low	/med)_LOW		Date Re	ceived <u>: C</u>	9/24/2008		
Solids <u>: 6</u>	4.8						
oncentrati	on Units (ug/L o	or mg/kg dry weig	rht): MG/KG	<u>.</u>	•	-	
[CAS No.	Analyte	Concentration	C.	Q	. M	
	7429-90-5	Aluminum	17700	1 1		P	
ł	7440-36-0		1.1	Jø		P	
t	7440-38-2		12.7	 "\		P	
.	7440-39-3		135	1 1		P	
ŀ	7440-41-7		0.34	JQ	·	P	
j	7440-43-9		1.6	1		P	with
İ	7440-70-2		4190	1		P	•
ŀ	7440-47-3		19.8	1		P	
.	7440-48-4	Cobalt	. 13,5		•	P	
f	7440-50-8		24.9			P	
F	7439-89-6	Iron	- 29300	1 .	-E-	P	
ľ	7439-92-1	Lead	7.0			P	
	7439-95-4	Magnesium	6550			P	
-	7439-96-5	Manganese	637			P	
	7439-97-6	Mercury	···			NR	
ľ	7440-02-0	Nickel	16.3			P	
Ī	7440-09-7	Potassium	1130			P	•
·	7782-49-2	Selenium	5.4	U	· · · · · · · · · · · · · · · · · · ·	P	
	7440-22-4	Silver	1.5	世	オレコト	- P	70
	7440-23-5		242	JQ		P	20 000 09
Ī	7440-28-0	Thallium	3.9	U		Р	
- 1	7440-62-2	Vanadium	64.4	1		P	
r	7440-66-6	Zinc	59.0		モゴレ	P	·
-	57-12-5	Cyanide	• •			NR	
.[-							
							Dar
lor Before	: BROWN	Clarity	Before:		Texture: <u>N</u>	<u>//EDIUM</u>	16-16-
lor After:_	YELLOW	Clarity	/ After:		Artifacts:_		<u>.</u> .
mments:	•						
	1					-	

		INORG	1A-IN ANIC ANALYSIS I	ነለጥለ ፍነ	ב ייסטו	EPA SA	AMPLE NO.
		INORU	ANIC ANALIBIS I	NUTA 9.	111313 F	MJAA68	
ab Name	СНЕМТЕСН С	ONSULTING GR	ROUP Contract: E	PW0604	<u>7</u> L		
ab Code:	СНЕМ	Case No.: <u>3782</u>	NRAS No.:	•	SDG No.	: MJAA5	5
latrix: (sc	oil/water) SOIL		Lab Sar	nple ID	Z4536-14		
evel: (lov	v/med <u>) LOW</u>		Date Re	ceived:	09/24/2008_	· •	<u>. </u>
Solids:	74.3						
oncentrat	ion Units (ug/L	or mg/kg dry weig	ght <u>): MG/KG</u>		•		
	CAS No.	Analyte	Concentration	С	. Q	M	
	7429-90-5	Aluminum	13000	1		P	ا غ.
	7440-36-0		1.3	JQ	·	P	
	7440-38-2	Arsenic	15.1	+ -3		P	
	7440-39-3	Barium	87.1	1		P	
	7440-41-7		0.25	JQ		P	
	7440-43-9	Cadmium	1.4	+		P	
	7440-70-2		3000	·		$\frac{1}{P}$	•
	7440-47-3	Chromium	17.6	 		P .	•
	7440-48-4		11.2	 		P	
	7440-50-8	Copper	24.1	 	· · · · · · · · · · · · · · · · · · ·	P	
	7439-89-6	Iron	26800	 	<u> </u>	P	
	7439-92-1	Lead	5.2	1	<u></u>	P	
i	7439-95-4		6770	 	·· ··	P	
•	7439-96-5		591	11		P	
	7439-97-6	Mercury				NR	20 OUT
	7440-02-0	Nickel	15.7			P	
Ī	7440-09-7	Potassium	800			P	
,	7782-49-2	Selenium	4.7	U		P	•
	7440-22-4	Silver	1,3	반	A NIL	P	•
1	7440-23-5	Sodium	143	JQ		P	
	7440-28-0	Thallium	3.4	Ū		P	•
	7440-62-2	Vanadium	54.1		.	P	
. [7440-66-6	Zinc	55.9		士」」と	P	
. [57-12 - 5	Cyanide				NR	
Γ			,		· · · · · · · · · · · · · · · · · · ·		
							DM
or Before	:: BROWN	Clarity	Before:	 -	Texture: ME	DIUM	امراند ۱۵-(۱۵
or After:_	YELLOW	_ Clarity	After:	<u> </u>	Artifacts:		<u> </u>
nama ara ta s							
mments:		•		•			
	•						 -

EPA	S.	Αľ	ΔP	L	Ε	N	0
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		INORG:	ANIC ANALYSIS D	ATA SH	ТЯЯ	EPA SAI	WILLING.
		HORO	vide WATTING D		<u>.</u>	MJ:	AA69
ab Name_0	СНЕМТЕСН СО	ONSULTING GR	OUP Contract: EF	W060 <u>47</u>			
ab Code: _	CHEM	Case No.: <u>3782</u>	5 NRAS No.:	·	SDG No	o.: MJAA55	
atrix: (soi	l/water <u>) SOIL</u>	· .	Lab San	nple ID <u>: 1</u>	Z4536-15		_
vel: (low	/med) LOW		Date Re	ceived <u>: 0</u>	9/24/2008		_
Solids <u>: 7</u>	5.1				,		
ncentrati	on Units (ug/L o	or mg/kg dry weig	ht <u>): MG/KG</u>				
	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5	Aluminum	13500			P	
	7440-36-0		1.0	JQ	•	P	
	7440-38-2		11.8	1 1		P	
ŀ	7440-39-3		103			P	
ŀ	7440-41-7		0,21	JQ		P	
İ	7440-43-9		1.4	1 3		P	: 2
	7440-70-2		2620	1		P	•
	7440-47-3		17.3			P	
·	7440-48-4	Cobalt	10.4	1		P	
Ì	7440-50-8		23.4	1		P	
	7439-89-6		27200	-	ــــــــــــــــــــــــــــــــــــــ	P	•
	7439-92-1	Lead	4.7	1	· . · · ·	P	
· .	7439-95-4		7930	 		P	
	7439-96-5		665			P	
· · ·	7439-97-6			 		NR	4
.	7440-02-0	Nickel	15.6		•	P	
.	7440-09-7		875			P	~
, -	7782-49-2		4.7	Ü		P	(C)
F	7440-22-4	Silver	. 0,16	J-	JO # JC	P	20000
-	7440-23-5	Sodium	126	JQ		P	- 20-
ľ	7440-28-0	Thallium	3.3	U		. P	
j		Vanadium	57.9			P	
f	7440-66-6		59.8	 	E- 31	_ P	••
F	57-12-5	Cyanide		 		NR	
ļ		-					
ļ	· 					-	DM
or Before	: BROWN	Clarity	Before:		Texture: <u>N</u>	IEDIUM	DM 10-16-
or After:	YELLOW	Clarity	After:		Artifacts:_		•
mments:							
							

Jame	CHEMTECH C	ONSULTING GR	ROUP Contract: El	PW06047			1 :
Code:	СНЕМ	Case No.: 3782	NRAS No.:	<u> </u>	SDG No.:	MJAA55	
x: (so	il/water) SOIL		Lab Sar	mple ID <u>: Z</u> 4	4536-16		_
(low	//med <u>) LOW</u>	•	Date Re	ceived <u>: 09/</u>	/24/2008	·	_
ids <u>:</u>	63.7						
ntrati	ion Units (ug/L	or mg/kg dry weig	ght <u>): MG/KG</u>			•	
	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5	Aluminum	19800	T		P	
	7440-36-0		· 1.2	Jø		P	
	7440-38-2		23.1		·	P	•
	7440-39-3		152	 		P	,
	7440-41-7		0.34	JQ		P	
	7440-43-9		1.9	 		P	
	7440-70-2		4340	1	· · · · · · · · · · · · · · · · · · ·	P	
ĺ	7440-47-3		25.9		·	P	
.	7440-48-4		17.0	1		P	
	7440-50-8		27.0			. P	
- 1	7439-89-6		35600	1	<u> </u>	P	
ı	7439-92-1	Lead	6.0	 	<u></u>	P	
Ī		Magnesium	9710	 		P	
Ī		Manganese	670	 		P	
ſ	7439-97-6	Mercury			1	NR	•
	7440-02-0		23.6			P	
- I	7440-09-7	Potassium	1000		······································	P	
•	7782-49-2	Selenium	. 5.5	U		P	
. [7440-22-4	Silver	1.6	¥.	4 UTL	P	20
- [7440-23-5	Sodium	159	JQ		P	25
. [7440-28-0	Thallium -	3.9	Ü		P	,
	7440-62-2	Vanadium	75.6			P	
	7440-66-6	Zinc	75.6°		上ナル	P	
	57-12-5	Cyanide				NR	
L							. 1
L							TM
efore	: BROWN	Clarity	Before:		Texture: ME	DILIM	۰ مد ۱٫۵۰
	YELLOW		After:	.	Artifacts:	~101 1 1	Ĺ
		_ · Omitty	2 14 POL -		An macts,	 -	•
its:							

EPA	SA	MPI	E	NO.
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	•	MUDG	ANIC ANALYSIS D	ATA CUE	ar -	EFA SA	MPLE NO.
•		DAOM	AINIC AINAL I BIB D	AIABIIEI	-1	MJ	AA71
b Name_	CHEMTECH CO	ONSULTING GR	LOUP Contract; EF	W06047	· <u> </u>		· · · · · · · · · · · · · · · · · · ·
b Code:	СНЕМ	Case No.: <u>3782</u>	NRAS No.:		SDG No.	: MJAA55	i. ·
atrix: (so	il/water <u>) SOIL</u>		Lab Sar	nple ID <u>: Z4</u>	536-17		
vel: (low	/med <u>) LOW</u>	<u>. </u>	Date Re	ceived <u>: 09/</u>	24/2008		
Solids <u>: 1</u>	73.3						•
ncentrati	on Units (ug/L	or mg/kg dry weig	ght): MG/KG				
	CAS No.	Analyte	Concentration	С	Q ·	М .	•
	7429-90-5	Aluminum	7190	T		P	
i		Antimony	0.63	JQ		P P	
	7440-38-2		6.7	 		P	×
	7440-39-3		. 91.3	 	,	P	
•	7440-41-7		0.21	JQ		P	
ļ		Cadmium	0.79			P	in maden.
. '	7440-70-2		2140			P	•
l	7440-47-3		11.6			P	
	7440-48-4		7.9		*	P	
ĺ	7440-50-8	Copper	8.0			P	
ı	7439-89-6		15400	1	£	P	
ļ	7439-92-1	Lead	3.4			P	
Ì	7439-95-4	Magnesium	3960		<u> </u>	P	
Ī	7439-96-5	Manganese	402			P	
·	7439-97-6	Mercury			<u> </u>	NR	
Ī	7440-02-0	Nickel	8.2			P	•
	7440-09-7	Potassium	996			P	•
Ĭ	7782-49-2	Selenium	4.7	Ū		P	7
ſ	7440-22-4	Silver	, 1.4	H-	- * ひょし	P	200ct L
Ī	7440-23-5	Sodium	136	JQ		P	2000
	7440-28-0		3.4	U		P	
		Vanadium	36.2	1		P	
	7440-66-6	Zinc	35.0		上ってし	P	
	57-12-5	Cyanide				NR	•
							DM
r Before	: BROWN	Clarity	y Before:		Texture: MI	EDIUM	10-16
r After:	YELLOW	Clarity	After:	 .	Artifacts:		
ments:							
			· · · · · · · · · · · · · · · · · · ·		<u>.</u>		

EPA	SA	MP	ΙF	NO
	$\omega_{\mathcal{L}}$	LIVII .	ندب	IYU.

Lab Code: <u>CHEM</u> Case No.: <u>37825</u>			25 NRAS No.:	NRAS No.: SDG No.: MJAA			
latrix: (soi	l/water <u>) SOIL</u>	· ·	Lab Sar	nple ID <u>: Z4</u>	536-18	· .	
evel: (low	med) LOW	· · ·	Date Re	ceived <u>: 09/</u>	24/2008		_
Solids <u>: 8</u>	0,8	· ,					
oncentratio	on Units (ug/L	or mg/kg dry wei	ght <u>): MG/KG</u>			•	
. [CAS No.	Analyte	Concentration		Q	М	-
•	7429-90-5				<u> </u>		
ŀ	7440-36-0		5050 7,4	ן יני	.	P	•
ŀ	7440-38-2		4.5	 		P	
}	7440-39-3		72.4	+		P	
	7440-41-7		0.17	JQ			•
	7440-43-9		0.69	ا په د	···	P	
·	7440-70-2		1630	 		P	
<u> </u>	7440-47-3		9.8	 		$\frac{P}{P}$	•
-	7440-48-4		5.8	JQ		P	•
<u> </u>	7440-50-8		5.0	1 300		$\frac{P}{P}$	• 1
ļ -	7439-89-6	Iron .	13500	 	<u>. E</u>	P	
-	7439-92-1	Lead	3.1	 		P	
-	7439-95-4		2770	 		P	•
	7439-96-5		322			P	•
	7439-97-6			 		NR	
	7440-02-0	Nickel	6.4			P	
	7440-09-7	Potassium	749	 	·	P	-7 8
	7782-49-2	Selenium	4.3	Ū	·	P	(1)
ា អង្	7440-22-4		1.2	U	₩ UJL	P	2000
-	7440-23-5		79.4	JQ		P	2000
	7440-28-0		÷ 3.1	Ū	<u> </u>	P	
	7440-62-2	Vanadium	29.7			P	
	7440-66-6		25.8		₽ JL	P	
	57-12-5	Cyanide				NR	
. [7.				
					-		Dr
or Before <u>:</u>	BROWN	Clarity	Before:		Texture: ME	DIUM	10-1
or After: \			After:_		Artifacts:		
nments:					2, 22 CLICATO (C)		, ,

1A-IN

EPA	S	AΝ	ÆΡΙ	F	NO

		113033517					
		11.01.01	ANIC ANALYSIS D.	TIT DII		MJ	AA83
Lab Name_	СНЕМТЕСН СО	ONSULTING GR	OUP Contract: EP	<u>W06047</u>			,
Lab Code:	<u>CHEM</u>	Case No.: <u>3782</u>	5 NRAS No.:		SDG No.	.: MJAA55	
Matrix: (soi	il/water) SOIL	· · ·	Lab San	ple ID <u>: Z</u>	Z4536-19		_
Level: (low	/med <u>)_LOW</u>		Date Re	eived <u>: 0</u>	9/24/2008		
% Solids <u>: <i>4</i></u>	17,3		•		•		
Concentrati	on Units (ug/L o	or mg/kg dry weig	ht <u>): MG/KG</u>				•
,	CAS No.	Analyte	Concentration	С	Q	М	
	7429-90-5	Aluminum	15300	T		P	•
	7440-36-0	Antimony	1.2	JQ		P	
	7440-38-2	Arsenic	17.6	" "		P	•
	7440-39-3		150			P	
	7440-41-7		0.39	JQ		P	
•	7440-43-9	Cadmium	2.0			P	460 2°
	7440-70-2	Calcium	3840	 		P	*
	7440-47-3		25.3		· =·	Р	
	7440-48-4	Cobalt	10.6			P	
ļ	7440-50-8	Copper	24.8			P	•
ļ	7439-89-6	Iron	37900		Æ	P	
ŀ	7439-92-1	Lead	8.7			P	,
	7439-95-4	Magnesium	4580		**···	P	
ľ	7439-96-5		583			P	•
	7439-97-6					NR	
·	7440-02-0	Nickel	25.7			P	\triangleright
	7440-09-7	Potassium	566	JQ		P	0.7
·	7782-49-2	Selenium	7.4	U		P	200ct 08
113 15	7440-22-4	Silver	2.1	H-	そ アマト	P	
ļ	7440-23-5	Sodium	221	JQ		P	
ľ	7440-28-0	Thallium	5.3	Ū		P	•
	7440-62-2	Vanadium	42.5	ŀ	•	P	
	7440-66-6	Zinc	72.7		₽ JL	P	
	57-12-5	Cyanide				NR	
-							•
L Color Before	- RPOWN	Clarit	y Before:		Texture: M	FDIIM	- 10-10-0
Color After:			After:		Artifacts:	EDICIM	- (0-(0-0
nioi Witel	IELLOW	Clairty	, , , , , , , , , , , , , , , , , , , ,		7 El El Tacto,		-
Comments:		•	•				•
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EPA S	SA	MР	LE	Ν	O
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		•		MJAAF6
Lab Name CHEMTECH CO	ONSULTING GROUP	Contract: EPW06047	. ، ا	
Lab Code: <u>CHEM</u>	Case No.: 37825	NRAS No.:	SDG No	.: MJAA55
Matrix: (soil/water) SOIL	 	Lab Sample ID: <u>Z4536-2</u>	0	
Level: (low/med) LOW		Date Received: 09/24/200)8	
% Solids: 81.5				:
Concentration Units (ug/L o	or mg/kg dry weight <u>): M</u>	G/KG		

7440-36-0 A 7440-38-2 A 7440-39-3 E 7440-41-7 E 7440-43-9 C	Aluminum Antimony Arsenic	3820 7.4 1.4	U		l P
7440-38-2 A 7440-39-3 F 7440-41-7 F 7440-43-9 C	Arsenic		TT		1 1
7440-39-3 I 7440-41-7 I 7440-43-9 C		1.4			P
7440-41-7 E 7440-43-9 C	1.	1.7			P
7440-43-9	Barium	66.2			P
	Beryllium	0.15	JQ		P
	Cadmium	0.57	JQ		P
7440-70-2 C	Calcium	1080			P
7440-47-3 C	Chromium	3.4.			P
7440-48-4 C	Cobalt	4.2	J 40		P
7440-50-8 C	Copper	2.3	JQ		· P
	ron .	12000		-يد	P
7439-92 - 1 L	ead	2.3			P
7439-95-4 N	/lagnesium	2030			P
7439-96 - 5 N	Manganese	255			Р
7439-97 - 6 N	fercury .				NR
7440-02-0 N	lickel	2.5 .	JQ		P
7440-09-7 P	otassium	634			P
7782-49-2 S	elenium	4.3	U		P
7440-22-4 S	ilver	1.2	IJ-	14 M2F	P
7440-23-5 S	odium	69.7	JΦ		P
7440-28-0 T	hallium	3.1	· U		P
7440-62-2 V	anadium	21.1			P
7440-66-6 Zi	inc	19.8		Em JL	Р
57-12-5 C	yanide .				NR

Color Be <u>f</u> ore <u>: BROWN</u>	Clarity Before:	Texture: MEDIUM
Color After: YELLOW	Clarity After:	Artifacts:
Comments:		

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9-IN METHOD DETECTION LIMITS (ANNUALLY)

Lab Name CHEMTECH CO	ONSULTING GROUP	Contract: EPW06047	
Lab Code: <u>CHEM</u>	Case No.: 37825	NRAS No.:	SDG No.: MJAA55
Instrument Type: P	<u>-</u>	Instrument ID: P4	Date: 01/15/2008
Preparation Method: HS1			
Concentration Units (20/1 -			• •

Analyte	Wavelength /Mass	CRQL	MDL
Aluminum	308.20	20	0.69
Antimony	206.80	6	0.41
Arsenic	193.70	1	0.37
Barium	493.40	20	0.090
Beryllium	234.80	0.5	0.010
Cadmium	226.50	0.5	0.040
Calcium	373.60	500	3.3
Chromium	267.70	1	0.080
Cobalt	228.60	5	0.080
Copper	224.70	2.5	0.10
Iron	259.80	10	0.20
Lead	220.30	1	0.25
Magnesium	279.00	500	5.3
Manganese	257.60	1.5	0.17
Mercury		0.1	
Nickel ·	231.60	4	0.14
Potassium	766.40	500	4.7
Selenium	196.00	3.5	0.35
Silver	328.00	1	0.090
Sodium	589.50	500	· 2.4
Thallium	190.80	2.5	0.56
Vanadium	292.40	5	0.12
Zinc	206.20	6	0.070
Cyanide		2.5	· · · · · · · · · · · · · · · · · · ·
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9-IN METHOD DETECTION LIMITS (ANNUALLY)

Lab Name CHEMTECH CO	ONSULTING GROUP	Contract: EPW06047	-
Lab Code: <u>CHEM</u>	Case No.: 37825	NRAS No.:	SDG No.: MJAA55
Instrument Type: P	_	Instrument ID: P4	_ Date: 01/15/2008
Preparation Method: NP1	•	•	

Concentration Units (ug/L or mg/kg): UG/L

Analyte	Wavelength /Mass	CRQL	MDL
Aluminum	308.20	200	12.4
Antimony	206.80	- 60	2.3
Arsenic	193.70	10	4.1
Barium	493.40	200	2.6
Beryllium	234.80	5	0.20
Cadmium	226.50	5	0.40
Calcium	373.60	5000	106 -
Chromium	267.70	10	0.80
Cobalt	228.60	50	1.0
Copper	224.70	25	1.6
Iron	259.80	100	3.6
Lead	220.30	10	4.2
Magnesium	279.00	5000	31.2
Manganese	257.60	15.	1.9
Mercury		0.2	
Nickel	231.60	40	2.9
Potassium	766.40	5000	35.9
Selenium	196.00	35	3.9
Silver	328.00	10	0.90
Sodium	589.50	5000	25.1
Thallium	190.80	25	2.2
Vanadium	292.40	50	0.60
Zinc	206.20	60	0.70
Cyanide		10	

Comments:	4	•		•	
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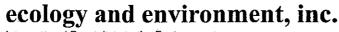
12-IN PREPARATION LOG

Lab Name <u>CHEMTECH CON</u>	SULTING GROUP	Contract: EPW06047	
		**	

Lab Code: CHEM Case No.: 37825 NRAS No.: SDG No.: MJAA55

Preparation Method: HS1

No. Preparation Date Weight (gram) Volume (mL)	EPA			
No. Date (gram) (mL)		Preparation	Weight	Volume
MJAA55 09/29/2008 1.00 100 MJAA56 09/29/2008 1.00 100 MJAA57 09/29/2008 1.00 100 MJAA58 09/29/2008 1.02 100 MJAA59 09/29/2008 1.02 100 MJAA60 09/29/2008 1.01 100 MJAA61 09/29/2008 1.00 100 MJAA62 09/29/2008 1.00 100 MJAA63 09/29/2008 1.00 100 MJAA64 09/29/2008 1.00 100 MJAA65 09/29/2008 1.01 100 MJAA66 09/29/2008 1.01 100 MJAA67 09/29/2008 1.02 100 MJAA68 09/29/2008 1.00 100 MJAA69 09/29/2008 1.00 100 MJAA70 09/29/2008 1.00 100 MJAA71 09/29/2008 1.01 100 MJAA76 09/29/2008 1.00 100	No.		(gram)	(mL)
MJAA56 09/29/2008 1.00 100 MJAA57 09/29/2008 1.00 100 MJAA58 09/29/2008 1.02 100 MJAA59 09/29/2008 1.02 100 MJAA60 09/29/2008 1.01 100 MJAA61 09/29/2008 1.00 100 MJAA62 09/29/2008 1.00 100 MJAA63 09/29/2008 1.00 100 MJAA64 09/29/2008 1.00 100 MJAA65 09/29/2008 1.01 100 MJAA66 09/29/2008 1.01 100 MJAA66 09/29/2008 1.02 100 MJAA66 09/29/2008 1.00 100 MJAA68 09/29/2008 1.00 100 MJAA70 09/29/2008 1.00 100 MJAA71 09/29/2008 1.01 100 MJAA72 09/29/2008 1.01 100 MJAA76 09/29/2008 1.00 100	LCSS	09/29/2008	1,00	100
MJAA57 09/29/2008 1.00 100 MJAA58 09/29/2008 1.02 100 MJAA59 09/29/2008 1.02 100 MJAA60 09/29/2008 1.01 100 MJAA61 09/29/2008 1.00 100 MJAA62 09/29/2008 1.00 100 MJAA63 09/29/2008 1.00 100 MJAA64 09/29/2008 1.00 100 MJAA65 09/29/2008 1.01 100 MJAA66 09/29/2008 1.01 100 MJAA67 09/29/2008 1.00 100 MJAA68 09/29/2008 1.00 100 MJAA69 09/29/2008 1.00 100 MJAA70 09/29/2008 1.01 100 MJAA71 09/29/2008 1.01 100 MJAA72 09/29/2008 1.01 100 MJAA76 09/29/2008 1.00 100 MJAAF6 09/29/2008 1.00 100	MJAA55			100
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MJAA63 09/29/2008 1.00 100 MJAA64 09/29/2008 1.00 100 MJAA65 09/29/2008 1.01 100 MJAA66 09/29/2008 1.02 100 MJAA67 09/29/2008 1.00 100 MJAA68 09/29/2008 1.00 100 MJAA69 09/29/2008 1.00 100 MJAA70 09/29/2008 1.00 100 MJAA71 09/29/2008 1.01 100 MJAA72 09/29/2008 1.01 100 MJAA83 09/29/2008 1.00 100 MJAAF6 09/29/2008 1.00 100 MJAAF6D 09/29/2008 1.00 100 MJAAF6S 09/29/2008 1.00 100 PBS 09/29/2008 1.00 100	MJAA61	09/29/2008	1.00	100
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MJAA66 09/29/2008 1.02 100 MJAA67 09/29/2008 1.00 100 MJAA68 09/29/2008 1.00 100 MJAA69 09/29/2008 1.00 100 MJAA70 09/29/2008 1.00 100 MJAA71 09/29/2008 1.01 100 MJAA72 09/29/2008 1.01 100 MJAA83 09/29/2008 1.00 100 MJAAF6 09/29/2008 1.00 100 MJAAF6D 09/29/2008 1.00 100 MJAAF6S 09/29/2008 1.00 100 PBS 09/29/2008 1.00 100	MJAA64	09/29/2008	1.00	100
MJAA67 09/29/2008 1.00 100 MJAA68 09/29/2008 1.00 100 MJAA69 09/29/2008 1.00 100 MJAA70 09/29/2008 1.00 100 MJAA71 09/29/2008 1.01 100 MJAA72 09/29/2008 1.01 100 MJAA83 09/29/2008 1.00 100 MJAAF6 09/29/2008 1.00 100 MJAAF6D 09/29/2008 1.00 100 MJAAF6S 09/29/2008 1.00 100 PBS 09/29/2008 1.00 100	MJAA65	. 09/29/2008	1,01	100
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MJAA72 09/29/2008 1.01 100 MJAA83 09/29/2008 1.00 100 MJAAF6 09/29/2008 1.00 100 MJAAF6D 09/29/2008 1.00 100 MJAAF6S 09/29/2008 1.00 100 PBS 09/29/2008 1.00 100	MJAA70	09/29/2008	1.00	100
MJAA83 09/29/2008 1.00 100 MJAAF6 09/29/2008 1.00 100 MJAAF6D 09/29/2008 1.00 100 MJAAF6S 09/29/2008 1.00 100 PBS 09/29/2008 1.00 100	MJAA71	09/29/2008	· I.01	100
MJAAF6 09/29/2008 1.00 100 MJAAF6D 09/29/2008 1.00 100 MJAAF6S 09/29/2008 1.00 100 PBS 09/29/2008 1.00 100	MJAA72	II	1.01	100
MJAAF6D 09/29/2008 1.00 100 MJAAF6S 09/29/2008 1.00 100 PBS 09/29/2008 1.00 100	MJAA83	1		100
MJAAF6S 09/29/2008 1.00 100 PBS 09/29/2008 1.00 100	MJAAF6	1	1.00	100
PBS 09/29/2008 1.00 100		I I		100
	MJAAF6S	09/29/2008	- 1.00	100
	PBS	09/29/2008	1.00	100
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International Specialists in the Environment

720 Third Avenue, Suite 1700, Seattle, WA 98104 Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE:

December 12, 2008

TO:

Mark Woodke, START-3 Project Manager, E & E, Seattle, Washington

FROM:

Bryan Vasser, START-3 Chemist, E & E, Seattle, Washington 8/1

SUBJ:

Inorganic Data Summary Check,

Tuluksak River Site, Tuluksak, Alaska

REF:

TDD: 08-02-0017

PAN: 002233.0324.01SI

The data summary check of 13 soil samples collected from the Tuluksak River site located in Tuluksak, Alaska, has been completed. Mercury analyses (EPA CLP SOW ILM05.4) were performed by Chemtech Laboratory, Mountainside, New Jersey.

The samples were numbered:

MJAA84 MJAA85 MJAA86 MJAA87 MJAA95 MJAA96 MJAA97 MJAA98 MJAAB6 MJAAB7 MJAAB8 MJAAF7

MJAAF8

No discrepancies were noted.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 10

1200 Sixth Avenue, Suite 900 Seattle, Washington 98101

December 5, 2008

Reply To

Attn. Of: OEA-095

MEMORANDUM

SUBJECT: Data Validation for Tuluksak River SI.

Case# 37825, SDG: MJAAB7, Mercury Analyses

FROM: Jennifer Crawford, Chemist

Environmental Services Unit-OEA

TO: Brandon Perkins, Site Assessment Manager

Office of Environmental Cleanup (ECL-112)

CC: Renee Nordeen, Ecology & Environment

The data validation of inorganic analyses for the above sample set is complete. Thirteen (13) soil samples were analyzed for mercury by Chemtech Laboratory, Mountainside, NJ. Sample numbers for this delivery group are:

MJAA84 MJAA85 MJAA86 MJAA87 MJAA95 MJAA96 MJAA97 MJAA98 MJAAB6 MJAAB7 MJAAB8 MJAAF7 MJAAF8

DATA QUALIFICATIONS

The following comments refer to the lab's performance in meeting the specifications outlined in the "CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILM05.4", the "USEPA CLP National Functional Guidelines for Inorganic Data Review" and the judgment of the reviewer. The comments presented herein are based on the information provided for the review.

TIMELINESS - Acceptable

No technical holding time requirements have been established for mercury in solid matrices. Samples were collected on 09/16/2008 and 09/17/2008. Mercury analysis (CV-AAS) was conducted on 10/23/2008.

INSTRUMENT CALIBRATION/VERIFICTION - Acceptable

A blank and five standards were analyzed for instrument calibration. The correlation coefficient (0.9999) was within the linearity criterion (≥ 0.995). Recoveries for verification standards (96-103%) met the frequency (10%) and recovery (80-120%) criteria. Quantitation verification standards met both

the frequency and recovery criteria for all analytes.

LABORATORY CONTROL SAMPLES (LCS) - Acceptable

Analyte recoveries for the LCS were within the established control limits for solid samples.

BLANKS - Acceptable

Preparation and instrument control blanks were prepared and analyzed in accordance with method requirements. Detected blank results were below the quantitation limit.

MATRIX SPIKE ANALYSIS - Acceptable

A matrix spike analysis was performed for sample MJAAF7. Percent recovery was within the recovery criterion (75-125%).

DUPLICATE SAMPLE ANALYSIS - Acceptable

A duplicate sample analysis was performed for sample MJAAF7. Relative percent difference (RPD) was not calculated for the duplicate sample analysis, as both native and duplicate had non-detect results.

ASSESSMENT SUMMARY

The following is a summary of qualified data:

Sample results above the lab MDL and below the CRQL were qualified (JQ).

DATA QUALIFIERS

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- J The associated value is an estimated quantity.
- R The data are unusable. The analyte may or may not be present in the sample.
- UJ The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

PROJECT SPECIFIC DATA QUALIFIERS:

- L Low bias.
- H High bias.
- K Unknown Bias.
- Q Detected concentration is below the method reporting limit / Contract Required Quantitation Limit, but is above the method detection limit.

EPA	0.4	1 mm	Ψ,	3.T/3
EPA	32	UVIPI	JE.	NU

ab Code: .	CHEM	Case No.: 3782	5 NRAS No.: _		SDG No.	: МЈААВ7	
latrix: (soi	l/water) SOIL		Lab Sam	ple ID <u>:</u>	Z5073-11		_
evel: (low	/med)_LOW_		Date Rec	eived:	09/24/2008		_
Solids <u>: 9</u>	93.5 √					,	•
oncentrati	on Units (ug/L o	or mg/kg dry weig	.ht <u>): MG/KG</u>		· ·		
ļ	CAS No.	Analyte	Concentration	C	Q	М	
ŀ	7429-90-5	Aluminum				NR	
ļ	7440-36-0					NR	
	7440-38-2	Arsenic				NR	
Į.	7440-39-3	Barium				NR	,
	7440-41-7					NR	
		Cadmium			<u> </u>	NR	•
].	7440-70-2					NR	•
	7440-47-3					NR	•
1	7440-48-4					NR	
	7440-50-8	Copper	·	· -		NR	
ļ.	7439-89-6		·	<u> </u>	· · · · · · · · · · · · · · · · · · ·	NR	
· ·	7439-92-1	Lead				NR	
<u> </u> -	7439-95-4				and the second s	NR	
·	7439-96-5			77		NR	
- ⊦	7439-97-6	Mercury	0.10 🗸	U		CV	
. ⊦	7440-02-0	Nickel				NR	
L	7440-09-7	Potassium			 -	NR	-
}-	7782-49-2 7440-22-4	Selenium				NR NR	
ļ-	7440-22-4	Silver Sodium					
	7440-23-3	Thallium				NR NR	
<u> </u>		Vanadium				NR NR	
- t	7440-66-6	Zinc				NR	
<u> </u>	57-12-5	Cyanide				NR	
, <u> </u> -	37-12-3	Сушинс				1111	
. <u>}</u>						+	
. Г	-					 	•
or Before	BROWN	Clarity	Before:		Texture: ME	DIUM	
	YELLOW		After:		Artifacts:		01/24/

EPA	SAMP	ĽΈ	NO
\mathbf{r}	OUTATE		INO

latrix: (soil/w evel: (low/mo	vater <u>) SOIL</u> ed <u>) LOW</u>	Analyte Aluminum Antimony Arsenic Barium Beryllium	Date Rec	ple ID <u>:</u>	SDG No Z5073-02 09/24/2008	M NR NR	
evel: (low/mo	ed) LOW 7	Analyte Aluminum Antimony Arsenic Barium Beryllium	Date Rec	erived <u>: (</u>	09/24/2008	NR	
Solids <u>: 93.7</u>	Units (ug/L o CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9	Analyte Aluminum Antimony Arsenic Barium Beryllium	ght): MG/KG			NR	
	Units (ug/L o CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9	Analyte Aluminum Antimony Arsenic Barium Beryllium		C	Q	NR	
oncentration	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9	Analyte Aluminum Antimony Arsenic Barium Beryllium		С	Q	NR	
	7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9	Aluminum Antimony Arsenic Barium Beryllium	Concentration	C	Q	NR	
	7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9	Antimony Arsenic Barium Beryllium			•		
	7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9	Antimony Arsenic Barium Beryllium				NR	
	7440-38-2 7440-39-3 7440-41-7 7440-43-9	Arsenic Barium Beryllium		 +			
	7440-39-3 7440-41-7 7440-43-9	Barium Beryllium) 1		NR	
	7440-41-7 7440-43-9	Beryllium				NR	
	7440-43-9					NR	
	7440-70-2	Cadmium	<u> </u>			NR	
		Calcium				NR	
	7440-47-3	Chromium				NR	
. [7440-48-4	Cobalt			-	NR	
	7440-50-8	Copper	<u> </u>			NR	
	7439-89-6	Iron	,			NR	
<u></u>	7439-92-1	Lead				NR	
	7439-95-4	Magnesium				NR	
	7439-96-5	Manganese	/			NR	
	7439-97-6	Mercury	0.11	_U		CV	
	7440-02-0	Nickel				NR	
	7440-09-7	Potassium				NR _	
	7782-49-2	Selenium				NR	•
. [7440-22-4	Silver				NR	
	7440-23-5	Sodium				NR	
	7440-28-0	Thallium				NR	
	7440-62-2	Vanadium				NR	•
	7440-66-6	Zinc				NR	
	57-12-5	Cyanide				NR	
						<u> </u>	
•						T ~	, _
						# 1 8 N	1/2
lor Before <u>: B</u>	<u> </u>		y Before:		Texture: <u>N</u>	IEDIUM	
lor After: <u>YE</u>	ELLOW	Clarity	y After:		Artifacts:_		
			and the second			•	
mments:			,			-	

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

ah Name	b Name CHEMTECH CONSULTING GROUP Contract: EPW06047					M	MJAA86		
ıb Code:	CHEM	Case No : <u>3782</u>	5 NRAS No.: _		SDG N	lo.: MJAAE	7		
atrix: (so	oil/water <u>)_SOIL</u>	·	Lab San	ple ID <u>: Z5</u>	073-09		· ·		
vel: (low	v/med) LOW	 .	Date Rec	ceived <u>: 09/</u>	24/2008		<u>. </u>		
Solids:	95.2 √			•		•	·		
ncentrati	ion Units (ug/L o	or mg/kg dry weig	ht <u>): MG/KG</u>		•				
	CAS No.	Analyte	Concentration	C	Q	M			
	7429-90-5			T		NR			
	7440-36-0			+	-:	NR.			
	7440-38-2			 		NR	_		
	7440-39-3		· · · · · · · · · · · · · · · · · · ·			NR	·		
	7440-41-7					NR			
	7440-43-9					NR			
	7440-70-2					NR			
	7440-47-3	Chromium	· · · · · · · · · · · · · · · · · · ·			NR			
·	7440-48-4	Cobalt				NR			
	7440-50-8	Соррег				NR	٠.		
	7439-89-6					NR			
	7439-92-1	Lead				NR			
	7439-95-4	Magnesium				NR			
	7439-96-5					NR	•		
Ī	7439-97-6		0.10	U.		CV			
Ţ	7440-02-0				4	NR			
. [7440-09-7	Potassium			•	NR			
· f	7782-49-2	Selenium			. * •	NR			
Ī	7440-22-4			·		NR			
·	7440-23-5	Sodium				NR			
Ţ	7440-28-0					NR			
1	7440-62-2	Vanadium				NR			
Ī	7440-66-6	Zinc				NR			
· [57-12-5	Cyanide				NR			
. [1								

Color Before: BROWN	Clarity Before:		Texture: MEDIUM	
Color After: YELLOW	Clarity After:		Artifacts:	XI . a
Comments:	·	· ·		11/24/08
				
	.			· ·

EPA	0.4	1 mi	177	3.10
EFA	- N.	MAL	ъD	NU

ah Nama 1	ים בידעום בי	אופו זו זייאור פים	OUP Contract: EF	ነኧ/በሯስ/ም	•		A87
		•			<u> </u>		
ab Code: _	CHEM	Case No.: 3782	5 NRAS No.:		SDG N	lo.: MJAAB7	
atrix: (soi	l/water <u>) SOIL</u>		Lab San	nple ID <u>: 2</u>	5073-03	·	<u>.</u>
vel: (low/	med) LOW	<u>. </u>	Date Re	ceived <u>: 09</u>	0/24/2008	<u> </u>	_
Solids <u>: 7</u>	93 🗸	•					
ncentratio	on Units (ug/L o	or mg/kg dry weig	ght): MG/KG				
. 1	· · · · · ·		,				•
	CAS No.	Analyte	Concentration	C	Q	M	
	7429-90-5					NR	
	7440-36-0				<u> </u>	NR	
1	7440-38-2			↓	·	NR	
· . [7440-39-3				_ `	NR NR	
	7440-41-7		<u> </u>	 		NR	
ļ	7440-43-9		<u> </u>	1 - 1 -		NR	
1	7440-70-2		<u> </u>	 		'NR	
.	7440-47-3				<u> </u>	NR	
<u> </u>	7440-48-4	ļ 	· · · · · · · · · · · · · · · · · · ·	 		NR	
<u> </u>	7440-50-8			 		NR	
. }	7439-89-6		 	 	· · · · · · · · ·	NR	
+	7439-92-1		- 		_ -	NR NR	•
- -		Magnesium		 -		NR	•
ļ.		Manganese	0.13 🗸	U		NR	
 -	7439-97-6		0.13 🗸			CV	
 	7440-02-0			 		NR NR	
-	7440-09-7			 -		NR	
ļ.	7782-49-2			 	_`	NR	
-	7440-22-4			 - -		NR	
Ļ	7440-23-5 7440-28-0			├		NR	
· }		Vanadium Vanadium		 		NR NR	
	7440-62-2 7440-66-6	Zinc		 		NR NR	
-		Cyanide			 _	NR NR	
ŀ	3/-12-3	Суание	·			- INIK	
-							
or Before	: BROWN	Clarity	/ Before:		Texture: N	MEDIUM	70.
or After:_	YELLOW	Clarity	After:		Artifacts:		11/24/
nments:			,	_··			
	_		·			·	

EPA	SAMPI	LE NO
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ab Name_	CHEMTECH C	<u>ONSULTING GR</u>	OUP Contract: EP	<u>W06047</u>	;-		
ab Code:	CHEM	Case No.: <u>3782</u>	5 NRAS No.:		SDG No	o.: MJAAB	7
atrix: (so	il/water <u>) SOIL</u>		Lab San	nple ID <u>: Z:</u>	5073-04		
evel: (low	/med) LOW		Date Re	ceived <u>: 09</u>	/24/2008		
					<u> </u>		
Solids: :	54.4						
ncentrati	ion Units (ug/L o	or mg/kg dry weig	ht): MG/KG	·	*	M .	
	CAS No.	Analyte	Concentration	C .	Q	М	
			Concentration	<u> </u>			
- "	7429-90-5			 	- · 	NR NR	
l	7440-36-0 7440-38-2		·	 - -		NR NR	
· · · ·	7440-39-3			 		NR NR	
•	7440-41-7					NR	
	7440-43-9					NR NR	
	7440-70-2			┼──┼─	,	NR	
	7440-47-3			 	· · · · · · · · · · · · · · · · · · ·	NR	•
	7440-48-4					NR	
.]	7440-50-8					NR	
	7439-89-6			 		NR	
.	7439-92-1			 	,	NR	
ţ	7439-95-4					NR	
		Manganese				NR	
·	7439-97-6		0.18	U		CV	
5	7440-02-0					NR	
1	7440-09-7	Potassium				NR	
- [7782-49-2	Selenium				NR	
Ţ	7440-22-4	Silver				NR	_
` [7440-23-5	Sodium				NR	, F
[7440-28-0	Thallium				NR	August 1
	7440-62-2	Vanadium				NR	
	7440-66-6		·	·	· .	NR_	
L	57-12-5	Cyanide		<u> </u>		NR_	
L							
. <u>L</u>					·		
r Before	: BROWN	Clarity	Before:		Texture: <u>N</u>	ÆDIUM_	2/2-1
or After	YELLOW	Clarity	After:	1	Artifacts:_		
_							• •
nments:							

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		INORG	ANIC ANALYSIS D	AIA 9H	EEI		
ah Mama (ONSULTING GR	OUP Contract: EF	WASAA	,	MJA	LA96 ,
ab Code: _	CHEM	Case No.: <u>3782</u>	5 NRAS No.:		SDG	No.: MJAAB7	
latrix: (soi	l/water) SOIL	<u> </u>	Lab Sar	nple ID <u>: </u>	Z5073-05	· · · · · · · · · · · · · · · · · · ·	-
evel: (low	med) LOW	 .	Date Re	ceived <u>: 0</u>	9/24/2008		-
6 Solids <u>: 9</u>	2.1	•		•	•		
	•	or mg/kg dry weig	ht) MG/KG				
Olloominger	·						
	CAS No.	Analyte	Concentration	C	<u>Q</u>	M	•
)	7429-90-5					NR	
	7440-36-0					NR	4
ļ	7440-38-2			 		NR	
	7440-39-3				<u> </u>	NR NR	
į	7440-41-7		<u> </u>	1	·	NR	
,	7440-43-9				<u> </u>	NR.	
ļ	7440-70-2					NR:	
·	7440-47-3					NR	
	7440-48-4			11		NR	
	7440-50-8					NR	
1	7439-89-6			1	· · · · · · · · · · · · · · · · · · ·	NR	
Ţ	7439-92-1	Lead				NR	
	7439-95-4				<u> </u>	NR_	
L	7439-96-5			<u> </u>		NR_	
	7439-97-6		0.11	U		CV	
L	7440-02-0	Nickel				NR	
	7440-09-7					NR_	•
· L	7782-49-2	Selenium				NR	
	7440-22-4	Silver				NR_	
· [7440-23-5	Sodium				NR.	
. [Thallium				NR	
	7440-62-2	Vanadium				NR	
	7440-66-6	Zinc				NR	
	57-12-5	Cyanide				NR	•
Ļ							
or Before	BROWN	Clarity	Before:		Texture	: MEDIUM_	11/24
		•	•		•		11/24
lor After:_	YELLOW	Clarity	After:		Artifact	s:	
mments:				-	-		
							and the second second

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

	MJAA97
Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047	<u> </u>
Lab Code: <u>CHEM</u> Case No.: <u>37825</u> NRAS No.:	SDG No.: MJAAB7
Matrix: (soil/water) SOIL Lab Sample ID: Z	5073-06
Level: (low/med) LOW Date Received: 09	/24/2008
% Solids: 91.8 \(\square \)	
Concentration Units (ug/L or mg/kg dry weight): MG/KG	
CAS No. Analyte Concentration C	Q M

CAS No.	Analyte	Concentration	C_	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	. 5			NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	`			NR
7440-41-7	Beryllium .				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
	Chromium			<u> </u>	NR
	Cobalt		<u> </u>		NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
	Lead				NR
					NR
	Manganese		<u> </u>		NR
7439-97-6	Mercury	0.11 🗸	U		CV
7440-02-0	Nickel				NR
	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
					NR
7440-62-2	Vanadium				NR
7440-66 - 6	Zinc				NR
57-12-5	Суапіде				NR
	7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-47-3 7440-48-4 7440-50-8 7439-92-1 7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-02-0 7440-22-4 7440-23-5 7440-28-0 7440-66-6	7429-90-5 Aluminum 7440-36-0 Antimony 7440-38-2 Arsenic 7440-39-3 Barium 7440-41-7 Beryllium 7440-43-9 Cadmium 7440-70-2 Calcium 7440-48-4 Cobalt 7440-50-8 Copper 7439-89-6 Iron 7439-92-1 Lead 7439-95-4 Magnesium 7439-96-5 Manganese 7439-97-6 Mercury 7440-02-0 Nickel 7440-09-7 Potassium 7440-22-4 Silver 7440-23-5 Sodium 7440-28-0 Thallium 7440-62-2 Vanadium 7440-66-6 Zinc	7429-90-5 Aluminum 7440-36-0 Antimony 7440-38-2 Arsenic 7440-39-3 Barium 7440-41-7 Beryllium 7440-43-9 Cadmium 7440-47-3 Chromium 7440-48-4 Cobalt 7440-50-8 Copper 7439-89-6 Iron 7439-92-1 Lead 7439-95-4 Magnesium 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7740-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc	7429-90-5 Aluminum 7440-36-0 Antimony 7440-38-2 Arsenic 7440-39-3 Barium 7440-41-7 Beryllium 7440-43-9 Cadmium 7440-47-3 Chromium 7440-48-4 Cobalt 7440-50-8 Copper 7439-89-6 Iron 7439-92-1 Lead 7439-95-4 Magnesium 7440-02-0 Mickel 7440-02-0 Nickel 7440-09-7 Potassium 7440-22-4 Silver 7440-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc	7429-90-5 Aluminum 7440-36-0 Antimony 7440-38-2 Arsenic 7440-39-3 Barium 7440-41-7 Beryllium 7440-43-9 Cadmium 7440-70-2 Calcium 7440-48-4 Cobalt 7440-50-8 Copper 7439-89-6 Iron 7439-92-1 Lead 7439-95-4 Magnesium 7439-96-5 Manganese 7439-97-6 Mercury 7440-02-0 Nickel 7440-02-0 Nickel 7440-22-4 Silver 7440-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc

Color Before: BROWN	Clarity Before:	Texture: MEDIUM
Color After: YELLOW	Clarity After:	Artifacts:
Comments:		"
		
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		NIODG	IA-IN ANIC ANALYSIS D	ATA CHEE	ידי	EPA SAM	FLE NO.
	•	INORU	WILL WANT 1 212 D	ALA SULE	.1	МЈА	A98
ab Name_	CHEMTECH CO	ONSULTING GR	OUP Contract: EF	W06047		·L	<u> </u>
b Code:	CHEM	Case No.: <u>3782</u>	5 NRAS No.:		SDG N	ю.: МЛААВ7	•
atrix: (so	il/water <u>) SOIL</u>		Lab San	nple ID <u>: Z5</u> (073-07		
evel: (low	/med) LOW	<u>·</u>	Date Re	ceived <u>: 09/2</u>	4/2008		
Solids <u>: </u>	91.7 🗸		•			·	÷
ncentrati	on Units (ug/L c	r mg/kg dry weig	ght <u>): MG/KG</u>	- :	•		
	CAS No.	Analyte	Concentration	C	Q	M	
	7429-90-5			T		NR	
		Antimony		+	· 	NR NR	
	7440-38-2					NR NR	
	7440-39-3	Barium		 		NR NR	
	7440-33-3			 		NR NR	
	7440-43-9			 		NR NR	
	7440-70-2			 		NR NR	
	7440-47-3			 		NR NR	
ŀ	7440-48-4			 		NR .	
						NR NR	
	7440-50-8	Copper		 			-
}	7439-89-6	Iron	 	 -		NR	
	7439-92-1	Lead				NR	
ļ	7439-95-4			'		NR	
1		Manganese	0.11	 		NR	
· }		Mercury	0.11 ✓	U		CV	
,	7440-02-0	Nickel		 		NR	
. [7440-09-7	Potassium	·	<u> </u>		NR	
Ļ	7782-49-2	Selenium		-		NR	•
	7440-22-4	Silver	<u> </u>	<u> </u>		NR	
	7440-23-5	Sodium				NR	
1	7440-28-0	Thallium	<u> </u>		·	NR	•
Ļ	7440-62-2	Vanadium				NR	
<u>_</u>	7440-66-6	Zinc				NR	
	57-12-5	Cyanide				NR	
İ							•
or Before	: BROWN	Clarity	/ Before:	 .	Texture: 1	MEDIUM	8/24
or After:_	YELLOW	Clarity	After:	<u> </u>	Artifacts:	·	Win
nments:	• .				•		

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	CHEM	ONSULTING GI Case No.: 3782		_		: MJAAB7	
		Ciso 110 <u>270</u> 2		.	•		
K: (SC	oil/water) SOIL		Lab San	ipie ii) <u>:</u>	Z5073-08		-
(lov	v/med) LOW		Date Re	ceived <u>: (</u>	09/24/2008		
ids <u>:</u> _	86,6 /				***		
ntrat	ion Units (ug/L c	or mg/kg d ry wei	ght): MG/KG		•		
					<u> </u>		
	CAS No.	Analyte	Concentration	C	Q	M	
	7429-90-5			4	<u> </u>	NR	
	7440-36-0			 -		NR.	
	7440-38-2			├		NR	
	7440-39-3			 		NR	
	7440-41-7		· · ·	 - -	<u> </u>	NR	
	7440-43-9			} -+		NR	
	7440-70-2		·			NR	
• •	7440-47-3		· -	 		NR	
	7440-48-4			├	· · · · · · · · · · · · · · · · · · ·	NR	•
	7440-50-8		·	-		NR	
	7439-89-6			 		NR	
	7439-92-1			 		NR	
		Magnesium		} }-		NR	
	7439-90-3	Manganese	0.12 √	ן ט		NR CV	•
	7440-02-0		U.12 V	"			
	7440-02-0			-		NR NR	
- 1	7782-49-2			┝┈┼		NR NR	
ì	7/82-49-2		······································	-		NR NR	
	7440-23-5	Sodium				NR	
}	7440-28-0	Thallium	<u>-</u>			NR	
	7440-62-2					NR	
ŀ	7440-66-6			-		NR	1
ŀ	57-12-5					NR	
	37.12.3	Сушпос				+	N
ŀ						 	11/7
Ţ						<u> </u>	11.
efor	: BROWN	Clarit	y Before:		Texture: MI	EDIUM	-
^	NAME OF THE OWNER.				gr. seem. s		
ner:	YELLOW	Clarity	y After:		Artifacts:	,	
nts:	•	•					
1143.							

EPA	С.	1 T.	m	т	እፐሌ
r.r.a		W		٠г.	ואני

ab Name	CHEMTECH CO	ONSULTING GR	OUP Contract: EP	<u>W06047</u>			JAAB7
Lab Code:	CHEM	Case No.: <u>3782</u>	5 NRAS No.:		SDG	No.: MJAAB	7
Matrix: (so	il/water <u>) SOIL</u>		Lab San	iple ID <u>: 2</u>	Z5073-01		
Level: (low	/med) LOW		Date Re	eived: 09	9/24/2008		
% Solids <u>:</u>	84.0						•
Concentrati	ion Units (ug/L o	or mg/kg dry weig	ht <u>): MG/KG</u>				. =
	CAS No.	Analyte	Concentration	С	Q	М	
•	7429-90-5	Aluminum		T		NR	•
	7440-36-0					NR	
	7440-38-2			 	•	NR	
	7440-39-3	Barium				NR	
	7440-41-7	Beryllium				NR	•
	7440-43-9				· ·	NR	,•
	7440-70-2	Calcium				NR	
	7440-47-3	Chromium				NR	•
,	7440-48-4	Cobalt				NR	
·	7440-50-8	Соррег				NR	
	7439-89-6	Iron				NR	-
	7439-92-1	Lead				NR	
	7439-95-4	Magnesium				·NR	•
	7439-96-5	Manganese				NR	· .
	7439-97-6	Мегсшту	0.12 √	_ U.	·	CV	
	7440-02-0	Nickel				NR	
]	7440-09-7	Potassium				NR	-
[7782-49-2	Selenium				NR	
	7440-22-4					NR	
	7440-23-5	Sodium				NR	
· . [7440-28-0	Thallium	,			NR	
. [7440-62-2	Vanadium				NR	•
[7440-66-6	Zinc	·			NR	
1	57-12-5	Cyanide				NR	* •
							•
lor Before	: BROWN	Clarity	Before:		Texture:	MEDIUM	· -
lor After:	YELLOW	Clarity	After:		Artifacts	·	SV,

		NIODO	1A-IN ANIC ANALYSIS D	<i>ለጥል</i> ሮነ	TOOT .	EPA SAN	IPLE NO.	_
,	•	, INORC	IANIC ANAL I 313 D.	WIW 91		MJA	AB8	
Lab Name_	СНЕМТЕСН С	ONSULTING GI	ROUP Contract: EP	W0604	<u>7</u>	<u> </u>		
Lab Code:	CHEM	Case No.: 3782	25 NRAS No.:		SDG No.	.: МЈААВ7		
Matrix: (so	il/water <u>) SOIL</u>	· · ·	Lab San	ple ID:	Z5073-10		- -	
Level: (low	/med) LOW		Date Rec	ceived <u>:</u>	09/24/2008		-	
% Solids:	74.5 /	٠ ,	*		· .		•	
	-:	or mg/kg dry wei	ght): MG/KG					÷.
	CAS No.	Analyte	Concentration	. c	Q	M	•	
•	7429-90-5	Aluminum	1			NR		
	7440-36-0	Antimony		 		NR		
	7440-38-2	Arsenic				NR:	•	
	7440-39-3	Barium		1		NR		
	7440-41-7	Beryllium	· · · · · · · · · · · · · · · · · · ·			NR	**	
	7440-43-9		 .	!		NR		•
	7440-70-2			 		NR		
	7440-47-3					NR		
	7440-48-4			<u> </u>		NR		
	7440-50-8	Copper		 		NR		
	7439-89-6	Iron				NR		
	7439-92-1	Lead				NR	•	
	7439-95-4					NR		
• • • •	7439-96-5	Manganese				NR		
• · ·	7439-97-6	Мегсигу	0.088 /	-	JQ	CV		
·	7440-02-0	Nickel	0,030		<u> </u>	NR		
t	7440-09-7	Potassium			- :	NR	•	
•	7782-49-2	Selenium		+		NR		
	7440-22-4	Silver				NR.		
` †	7440-23-5	Sodium				NR		
·	7440-28-0	Thallium	- -			NR		٠.
	7440-62-2	Vanadium				NR		
}	7440-66-6	Zinc				NR		•
	57-12-5	Cyanide				NR		
	37 12 3	Cymnuc	·			1111		*
· }						 		•
Color Before	: BROWN	Clarit	y Before:		Texture: MI	EDJÚM_	Ya	
Color After:	YELLOW	Clarit	y After:		Artifacts:	*.	11	1215/48
Comments:							5	12/5/40

EPA	- \ Δ	MADI	R	NO

Lab Name (CHEMTECH CO	ONSULTING GR	OUP Contract: EP	<u>W06047</u>		 	AAF7
Lab Code: _	CHEM	Case No.: 3782	.5 NRAS No.:		SDG No	.: MJAAB7	
Matrix: (soi	l/water) SOIL	<u> </u>	Lab San	ple ID <u>: Z</u>	25073-13		_
Level: (low	med) LOW		Date Rec	ceived <u>: 09</u>	9/24/2008	<u> </u>	- ,
% Solids <u>: 4</u>	2.9 \						
Concentratio	on Units (ug/L o	or mg/kg dry weig	ght): MG/KG		•	•	·
	CAS No.	Analyte	Concentration	С	Q	М	•
,	7429-90-5	Aluminum		1	·	NR	
Ì	7440-36-0		<u> </u>	 		NR	
`	7440-38-2			 		NR	
ļ	7440-39-3			 		NR	
Ť		Beryllium	'			NR	
•	7440-43-9					NR	
1	7440-70-2					NR	
·	7440-47-3			 		NR	
1	7440-48-4		····			NR	
· I	7440-50-8				 	NR	
Ţ	7439-89-6					NR	
. [7439-92-1	Lead				NR	
Ī	7439-95-4	Magnesium				NR	
Ţ	7439-96-5	Manganese				NR	
Ī	7439-97-6	Mercury	0.23 🗸	U		CV	
	7440-02-0	Nickel				NR	*
Ī	7440-09-7	Potassium		T.		NR	
	7782-49-2					NR	•
· .	7440-22-4	Silver				NR	
. [7440-23-5	Sodium				NR	
·	7440-28-0					NR	
	7440-62-2	Vanadium				NR	
Γ	7440-66-6	Zinc				NR	•
	57-12-5	Cyanide				NR	
			· · · · · · · · · · · · · · · · · · ·				Þ
L					<u> </u>		×1.
olor Before	: BROWN	. .	y Before:		Texture: M	IEDIUM	11/24
olor After:	YELLOW	Clarity	/ After:	·	Artifacts:_		•
omments:							

1A-IN INORGANIC ANALYSIS DATA SHEET

Lab Name CHEMTECH CONSULTING GROUP Contract; EPW06047

EPA	0.4) mi	\mathbf{T}	> T/A
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MJAAF8

Lab Code:	CHEM	Case No.: <u>3782</u>	5 NRAS No.:_		SDG No.:	MJAAB7	
Matrix: (soi	l/water <u>) SOIL</u>	· · · · · · · · · · · · · · · · · · ·	Lab San	ıple ID <u>:</u>	Z5073-12		-
Level: (low	med) LOW	 .	Date Rec	ceived <u>:</u>	09/24/2008		_
% Solids <u>: 4</u>	5.4						· · ·
Concentration	on Units (ug/L	or mg/kg dry weig	ght): MG/KG	·			
	CAS No.	Analyte	Concentration	·C	Q	М	
,	7429-90-5	Aluminum	<u> </u>	Π .		NR	
- 1	7440-36-0.					NR	
	7440-38-2					NR	•
1	7440-39-3					NR	
	7440-41-7	Beryllium				NR	
. · · · · · · · · · · · · · · · · · · ·	7440-43-9		***	1		NR	
Ţ	7440-70-2	Calcium				NR	• *
Ţ	7440-47-3	Chromium				NR	
Ī	7440-48-4	Cobalt				NR	
ľ	7440-50-8	Copper		\Box		NR	
ľ	7439-89-6	Iron				NR	
·	7439-92-1	Lead				NR	
Ī	7439-95-4	Magnesium	,			NR	
·	7439-96-5	Manganese				NR	
ſ	7439-97-6	Mercury	0.095√	+	<u> </u>	CV	
ľ	7440-02-0	Nickel			1	NR	
. [7440-09-7	Potassium				NR	
	7782-49-2	Selenium		-		NR	
Γ	7440-22-4	Silver	,			NR	
Γ	7440-23 - 5	Sodium				NR	
. · [7440-28-0	Thallium				NR	
· · · · · · · · · · · · · · · · · · ·	7440-62-2	Vanadium				NR	· ·
Γ	7440-66-6	Zinc				NR	
	57-12-5	Cyanide				NR	· •
'[•			•
<u> </u>					· · · · · · · · · · · · · · · · · · ·		
Color Before	BROWN	Clarity	Before:		Texture: <u>ME</u>	DIUM	
Color After:_	YELLOW	Clarity	After:		Artifacts:		DU LINE
Comments:						- 	- 5 1215/08 or

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ecology and environment, inc.

International Specialists in the Environment

720 Third Avenue, Suite 1700, Seattle, WA 98104 Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE:

October 20, 2008

TO:

Mark Woodke, Project Manager, E & E, Seattle, Washington

FROM:

David Ikeda, Chemist, E & E, Seattle, Washington

SUBJ:

Inorganic Data Summary Check, Tuluksak River Site Inspection,

Tuluksak, Alaska

REF:

TDD: 08-02-0007

PAN: 002233.0324.01SI

The data quality assurance summary check of 13 soil samples collected from the Tuluksak River in Tuluksak, Alaska has been completed. Inorganic analyses (EPA CLP SOW ILM05.4) were performed by Chemtech, Mountainside, New Jersey.

The samples were numbered:

MJAA84	MJAA95	MJAA98	MJAAB8
MJAA85	MJAA96	MJAAB6	MJAAF7
MJAA86	MJAA97	MJAAB7	MJAAF8
MIAA87			

No discrepancies were noted. The secondary reviewer added "Q" bias qualifiers to positive sample results less than the contract required detection limit. For "Q" bias results, the secondary reviewer removed any qualifiers that the primary reviewer may have added.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 10

1200 Sixth Avenue, Suite 900 Seattle, Washington 98101

October 15, 2008

Reply To

Attn. Of: OEA-095

MEMORANDUM

SUBJECT: Data Validation for Tuluksak River Site Inspection,

Case# 37825, SDG: MJAAB6, Inorganic Analysis

FROM:

Donald Matheny, Chemist

Environmental Services Unit, OEA

TO:

Brandon Perkins, Site Assessment Manager

Office of Environmental Cleanup (ECL-112)

CC:

Renee Nordeen, Ecology & Environment

The data validation of inorganic analyses for the above sample set is complete. Thirteen (13) soil samples were analyzed for total elements by Chemtech, Mountainside, NJ. Sample numbers for this delivery group are as follows:

MJAA84 MJAA85 MJAA86 MJAA87 MJAA95 MJAA96 MJAA97 MJAA98 MJAAB6 MJAAB7 MJAAB8 MJAAF7 MJAAF8

DATA QUALIFICATIONS

The following comments refer to the lab's performance in meeting the specifications outlined in the "CLP Statement of Work (CLP-SOW) for Inorganic Analysis, rev. ILM05.4", the "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" and the judgment of the reviewer. The comments presented herein are based on the information provided for the review.

TIMELINESS - Acceptable

The holding time from the date of collection to the date of digestion and analyses were met for all elements (180 days). Samples were collected on 9/16/08 and 9/17/08. ICP-AES analysis was conducted on 10/6/08.

INSTRUMENT CALIBRATION/VERIFICTION - Acceptable

For ICP-AES analysis, instrument calibration was performed in accordance with method requirements. Recoveries for instrument verification standards (91-108%) met the frequency (10%) and recovery (90-110%).

Quantitation verification standards met both the frequency and recovery criteria for all elements.

ICP-AES INTERFERENCE CHECK SAMPLE (ICS) - Acceptable

An ICS was analyzed at the required frequency for each analytical run. ICS recoveries met the recovery criterion (80-120% or \pm 2xCRDL) for all elements.

LABORATORY CONTROL SAMPLES (LCS) - Acceptable

An aqueous Laboratory Control Sample was digested and analyzed. Percent recoveries (98-106%) were within the control limits (80-120%).

BLANKS - Acceptable

Preparation and instrument control blanks were prepared and analyzed in accordance with method requirements. Blanks were not detected at concentrations that impact sample values.

MATRIX SPIKE ANALYSIS

A matrix spike was analyzed for sample MJAAF7. Percent recoveries (87-120%) met the criterion (75-125%) for all elements with the exception of silver (47%). Silver data were qualified (JL or UJL) and may be biased low.

DUPLICATE SAMPLE ANALYSIS - Acceptable

A duplicate sample was analyzed for sample MJAAF7. Relative percent differences (\leq 3%) met the control limits (\pm 35% or \pm 2xCRQL) for soils.

ICP-AES SERIAL DILUTION

A five-fold serial dilution was analyzed for sample MJAAF7. Percent differences (< 11%) were within the 1% allowable variance from the acceptance criteria (< 10%) for all applicable elements with the exception of iron (13%), magnesium (12%), manganese (12%) and zinc (16%). Data for these elements were qualified (JL) and may be biased low.

ASSESSMENT SUMMARY

The following is a summary of qualified data:

Silver data were qualified (JL or UJL) due to a low matrix spike recovery. Silver values may be biased low.

Iron, magnesium, manganese and zinc data were qualified (JL) due to high percent differences in the serial dilution results. Values for these elements may be biased low.

DATA QUALIFIERS

- U The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- J The associated value is an estimated quantity.
- R The data are unusable. The analyte may or may not be present in the sample.
- UJ The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

PROJECT SPECIFIC DATA QUALIFIERS:

- L Low bias.
- H High bias.
- K Unknown Bias.
- Q Detected concentration is below the method reporting limit / Contract Required Quantitation Limit, but is above the method detection limit.

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lode: _(CHEM	Case No.: <u>3782</u>	25 NRAS No.:		SDG No.:	MJAAB)
x: (soi)	/water <u>) SOIL</u>	<u> </u>	Lab San	nple ID <u>: Z4</u>	666-11	_ 	
: (low/	med <u>) LOW</u>	 .	Date Re	ceived <u>: 09/</u>	24/2008		
ids <u>: 9</u>	3.5						
entratio	on Units (ug/L o	or mg/kg dry weig	ght <u>):_MG/KG</u>	· 			
	ÇAS No.	Analyte	Concentration	С	Q	М	
. [7429-90-5	Aluminum	7670	T		P	
\ \	7440-36-0	Antimony	6.4	Ū·		P	•
	7440-38-2		3.9			P	
. [7440-39-3	Barium	61.3			P	
Γ	7440-41-7	Beryllium	0.14	JQ		P	•
	7440-43-9		. 0.48	JQ		Р	-शस्त्र वर्षे
	7440-70-2	Calcium	1400		E	P	
	7440-47-3		5.1			P	
	7440-48-4	Cobalt	5.9		Æ	P	
	7440-50-8	Copper	10.8		. <u>Æ</u> .	P	
	7439-89-6		9770			P	
	7439-92-1		4.2	1		P	·
·		Magnesium	2190		+ JL	P	
L	7439-96-5		149	<u> </u>	L	P	
	7439-97-6					NR	
-	7440-02-0	Nickel	4.2	JQ		P	_
_	7440-09-7		1500	 		P	
. -	7782-49-2	Selenium	3.7	U		P	
<u> </u>	7440-22-4	Silver	1.1	U	H UJL	P	
<u> </u>	7440-23-5	Sodium	80.9	10	<u> </u>	P	
-	7440-28-0	Thallium	2.7	U		P	
• _	7440-62-2	Vanadium	30.9	 		P	2000
<u> </u>	7440-66-6	Zinc	24.4	 	₹ 2r	P	20 DC
<u> </u>	57-12-5	Cyanide	·	 		NR	•
<u> </u>			•	 		 	
				<u> </u>	·		~~
ofor-	BROWN	. Ola-14	y Before:		Texture: ME	או דוכני	
omic.	NIM OVE	Ciarii	y 15001c		i exture. <u>IVIE</u>	ואוטוען.	. (0
After: \	YELLOW	Clarit	y After:	<u></u>	Artifacts:		•
		-	, == 			-	•

1A-IN INORGANIC ANALYSIS DATA SHEET

EPA	-c	` A ∩ ∩ 1	_	7. 7	_
P.PA	7	IVIPI	٠r.	1/1	ι

evel: (low/n Solids <u>: 93</u>	water) SOIL ned) LOW	Case No.: <u>378.</u>	Lab S	.: ample ID <u>:</u>		No: MJAA1	B6
evel: (low/n Solids <u>: 93</u>	ned <u>) LOW</u>			ample ID <u>:</u>	74666-01		
Solids <u>: 93</u>	.7		· Date F		₹14000±01		,
				Received <u>: (</u>	09/24/2008		
oncentration	. Timita (na/li a						
	r omrs (ng/re o	r mg/kg dry wei	ght): MG/KG				
ľ	CAS No.	Analyte	Concentration		Q	M].
=				 -			╡ .
	7429-90-5 7440-36-0		9250 0.72	JQ		P	-
 - -	7440-38-2		6.9	ا ي	· · · · · · · · · · · · · · · · · · ·	. P	4
 	7440-36-2	Barium	31.6			P	-}
 -	7440-41-7		0.19	JQ		P	4
 	7440-41-7		1.5			P	4
·	7440-70-2	Calcium	1730		P	P	4
<u>}-</u> -	7440-47-3		1.6			P	1
<u> </u>	7440-48-4		4.3	JQ	E	P	· ·
	7440-50-8	Copper	7.8			P	-
<u> </u>	7439-89-6	Iron	28100			71_ P	1
 	7439-92-1	Lead	13.2	_	<u>-</u>	P	4
 		Magnesium	2320		E	JL P	†
-	7439-96-5		407			JL P	
<u> </u>	7439-97-6					NR	1
-	7440-02-0	Nickel	1.3	JQ		P	f .
-	7440-09-7		1500	-		P	
-	7782-49-2	Selenium	3.7	U		P	, .
	7440-22-4	Silver	0.13	. J	JQ # 7	P	_
	7440-23-5	Sodium	128	JQ		P	
	7440-28-0	Thallium	2.7	U		P	200
[-		Vanadium	22.6			P	200
	7440-66-6	Zinc	62.0		£-J	Г L P	
	57-12-5	Cyanide				NR	
				,			. • I
							~2h.
or Before:]	BROWN.	Clarit	y Before:		Texture	e: MEDIUM	DIV.
lor After: Y			y After:	<u> </u>	Artifac		
, or / 114011_	<u> </u>		· · · · · · · · · · · · · · · · · · ·		Ainao		
mments:		•					
		<u> </u>					

FORM IA-IN

ΈPΑ	SAN	ÆΙ	Æ	NC

Code: <u>CHEM</u> ix: (soil/water) il: (low/med) <u>I</u> olids: 95.2 centration Units CAS 742 744 744 744 744 744 744 74	SOIL SOIL S (ng/L of S No. 29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2	Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	25 NRAS No.: Lab Sar Date Re ght): MG/KG Concentration 11000 6.3 19.4 28.2 0.23 1.2 1520 5.6	nple ID <u>: Z</u>	 	M P P P P P P	36	
ix: (soil/water) I: (low/med) I Iids: 95.2 entration Units CAS 742 744 744 744 744 744 743 743	SOIL LOW S (ng/L) S No. 29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3	Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	Lab Sar Date Resemble 11000 Concentration 11000 6.3 19.4 28.2 0.23 1.2 1520 5.6	mple ID: 2	Q Q	M P P P P P P	36	
l: (low/med) <u>I</u> slids: 95.2 sentration Units CAS 742 744 744 744 744 744 743 743	S No. 29-90-5 40-36-0 40-38-2 40-41-7 40-43-9 40-70-2 40-47-3	Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	Date Registry: MG/KG Concentration 11000 6.3 19.4 28.2 0.23 1.2 1520 5.6	C U	Q Q	M P P P P P P		
CAS	s (ng/L of S No. 29-90-5 40-36-0 40-38-2 40-41-7 40-43-9 40-70-2 40-47-3	Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	ght): MG/KG Concentration 11000 6.3 19.4 28.2 0.23 1.2 1520 5.6	C	Q	P P P P P		
CAS 742 744 744 744 744 744 744 74	s (ng/L c S No. 29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3	Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	Concentration 11000 6.3 19.4 28.2 0.23 1.2 1520 5.6	U		P P P P P		
CAS 742 744 744 744 744 744 744 74	S No. 29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3	Analyte Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	Concentration 11000 6.3 19.4 28.2 0.23 1.2 1520 5.6	U		P P P P P		
742 744 744 744 744 744 744 743 743 743 743	29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	11000 6.3 19.4 28.2 0.23 1.2 1520 5.6	U		P P P P P		
742 744 744 744 744 744 744 743 743 743 743	29-90-5 40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	6.3 19.4 28.2 0.23 1.2 1520 5.6			P P P P P		
744 744 744 744 744 744 743 743 743 743	40-36-0 40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3	Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium	6.3 19.4 28.2 0.23 1.2 1520 5.6		E	P P P P P		
744 744 744 744 744 744 743 743 743 743	40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3	Arsenic Barium Beryllium Cadmium Calcium Chromium	19.4 28.2 0.23 1.2 1520 5.6		E	P P P P		
744 744 744 744 744 743 743 743 743 743	40-39-3 40-41-7 40-43-9 40-70-2 40-47-3	Barium Beryllium Cadmium Calcium Chromium	28.2 0.23 1.2 1520 5.6	16	E	P P P	, m	
744 744 744 744 743 743 743 743 743 744	40-41-7 40-43-9 40-70-2 40-47-3	Beryllium Cadmium Calcium Chromium	0.23 1.2 1520 5.6	J&	E	P P		
744 744 744 744 743 743 743 743 743	40-43-9 40-70-2 40-47-3	Cadmium Calcium Chromium	1.2 1520 5.6		E	P P	, m, , ,	
744 744 744 743 743 743 743 743 744	40-70-2 40-47-3	Calcium Chromium	1520 5.6		E	P		
744 744 743 743 743 743 743 744	10-47- 3	Chromium	5.6	+			ł	
744 743 743 743 743 743 743 744						P		
744 743 743 743 743 743 744			5.2	JQ	æ	P	}	
743 743 743 743 743 744	10-50-8		13.7	 ~	- E	P		•
743 743 743 743 744	39 - 89-6 ·		22200	 	E JL	. P		
743 743 743 744	39 - 92-1		12.9	+ +	<u> </u>	P		
743 743 744		Magnesium	4100	1	E JL	P		
743 744		Manganese	319	†	₽ JL	P		
744		Mercury		 		NR		
		Nickel	5.3			P		
		Potassium	2130	† †		P		
778	2-49-2		3.7	1 0 1	· · · · · · · · · · · · · · · · · · ·	P		
		Silver	1.1	U	15N 4		, .	
		Sodium	138	JQ	· · · · · · · · · · · · · · · · · · ·	P		زي
		Thallium	2.6	υ		P		D. C.
		Vanadium	18.4	1		P		3
	0-66-6	Zinc	56.2		上 上	P		
	7-12-5	Cyanide	•	1		NR		
				1		1		
 								~~
Before <u>: BROW</u>	vn	Clarit	y Before:		Texture: M	EDIIIM		,e ~
After: YELLO			y After:	 ,	Artifacts:			

EPA	ÐΛ	እ ለቤተ		ነፖ
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Code: _	CHEM	Case No.: 3782;	NRAS No.:		SDG No.:	MJAAB6	
rix: (soi	l/water <u>)_SOIL</u>		Lab Sar	nple ID <u>: Z</u>	4666-03		_
: :: (low/	med <u>) LOW</u>		Date Re	ceived: 09/	/24/2008		<u></u>
olids <u>: 7</u>	9.3	• .					
entratio	on Units (ug/L o	or mg/kg dry weig	ht <u>): MG/KG</u>		· · · · · · · · · · · · · · · · · · ·		
-	CAS No.	Analyte	Concentration	С	Q .	М	
F	7429-90-5	Aluminum	11700	T. T		P	
ţ	7440-36-0		7.5	Ü		P	
	7440-38-2	Arsenic	5.2			P	
- 1	7440-39-3		48.2	1.		P	
	7440-41-7		0.22	JQ		P	
t	7440-43-9		.1.2			P	
Ī	7440-70-2	Calcium	2310		P	P	1
<u> </u>	7440-47-3	Chromium	17.8			P	•
[7440-48-4	Cobalt	9.7		Æ	P	
Ī	7440-50-8	Соррег	18.6		Ł	P	
Γ	7439-89-6	Iron	23400		モゴト	P	
ſ	7439-92-1		5.7			P	•
ſ		Magnesium	5570		E Ji	P	
		Manganese	293		E JL	P	•
	7439-97-6					NR	
<u></u>	7440-02-0	Nickel	14.2		· · · · · · · · · · · · · · · · · · ·	P	
. [7440-09-7	Potassium	823			P	
	7782-49-2		4.4	U		P	
	7440-22-4	Silver .	1.2	₩.	₩ WJL	P.	
	7440-23-5 •		154	JO		P	T.
. [7440-28-0	Thallium	3.1	U	· · · · ·	P	2000
		Vanadium	50.4	 		P	200
3"	7440-66-6	Zinc	52.4		- 고ㄴ	P	-
	57-12-5	Cyanide		 	· ·	NR	
						<u> </u>	
. [_		<u> </u>		<u> </u>			
Before	: BROWN	Clarity	Before:	<u>. </u>	Texture: ME	DIUM	18-1
After:_	YELLOW_	Clarity	After:		Artifacts		
nents:			•			•	

IA-IN INORGANIC ANALYSIS DATA SHEFT

EPA SAMPLE NO.

			NIC ANALYSIS D				MJA	A95
ab Name_	CHEMTECH CO	<u>ONSULTING GRO</u>	DUP Contract: EF	<u> W0604</u>	7			
ab Code:	CHEM	Case No.: 37825	NRAS No.:		·	SDG N	o.: MJAAB6	
latrix: (so	il/water) SOIL		Lab Sar	nple ID	. <u>Z4666</u>	-04	·	-
evel: (low	/med) LOW		Date Re	ceived <u>:</u>	09/24/2	800	····	
Solids: <u></u>	54.4							
oncentrati	on Units (ug/L o	or mg/kg dry weigh	nt): MG/KG					
	CAS No.	Analyte	Concentration	С		Q	М	
	7429-90-5	Aluminum	33000				P	
	7440-36-0		10.8	Ū			P	
*	7440-38-2	Arsenic	17.1				P	
	7440-39-3	Barium	273				P	•
ı	7440-41-7			JQ			P	•
	7440-43-9		2.5				P	- TEE
i	7440-70-2		6690	1		-E-	P	
	7440-47-3		21.5			··:	P	
ţ	7440-48-4		22.0			Z	P	
i	7440-50-8	Соррег	63.4	ii	,	JE .	P	
•	7439-89-6	Iron	41800			₽ JL	P	
	7439-92- 1	Lead	14.4	-			P	
İ		Magnesium	10500			<u>₹</u> J.	P	
. 1	7439-96-5	Manganese	987			B JL		
Ţ	7439-97-6	Mercury					NR	
ľ	7440-02-0	Nickel	16.6		_		P	
Ţ	7440-09-7	Potassium	1870				P	
Ī	7782-49-2	Selenium	6.3	Ū			P	
·Ť	7440-22-4	Silver	0.26	ملي	3Q	H H	P	
· [7440-23-5	Sodium	377	JQ			P	())
	7440-28-0	Thallium	4.5	ט			P	080cT 08
	7440-62-2	Vanadium	120		,		P	UBU-
	7440-66-6	Zinc	98.5			上ゴト	P	
	57-12-5	Cyanide					NR	
ſ]				
. [
								10,18
or Before	: BROWN	Clarity	Before:		·.	Texture: N	1EDIUM	10
or After:	YELLOW	Clarity	After:			Artifacts:_		•
mments:		•	•	٠.				

EPA			

Vel: (low/med) LOW Date Received: 09/24/2008 Solids: 92.1		MJAA9		06047	Contract: <u>EP</u> V	NSULTING GROUP	НЕМТЕСН СС	Name_C
Date Received; 09/24/2008 Solids; 92.1		MJAAB6	SDG No.:	· · · · · · · · · · · · · · · · · · ·	VRAS No.: _	Case No.: <u>37825</u>	HEM	b Code: <u>C</u>
CAS No. Analyte Concentration C Q M			4666-05	e ID <u>: Z46</u>	Lab Sam	·	water) SOIL	atrix: (soil
CAS No. Analyte Concentration C Q M 7429-90-5 Aluminum 17300 P 7440-36-0 Antimony 6.5 U P 7440-38-2 Arsenic 11.9 P 7440-38-2 Arsenic 11.9 P 7440-39-3 Barium 88.8 P 7440-41-9 Beryllium 0.31 JQ P 7440-43-9 Cadmium 2.1 P 7440-47-3 Chromium 18.1 P 7440-48-4 Cobalt 13.4 E P 7440-48-4 Cobalt 13.4 E P 7439-89-6 Iron 37000 E JL P 7439-99-1 Lead 10.0 P P P 7439-95-4 Magnesium 9510 E JL P 7439-97-6 Mercury NR NR NR P P 7440-02-0 Nickel <t< td=""><td></td><td>·</td><td>/24/2008</td><td>ved<u>: 09/2</u></td><td>Date Rec</td><td></td><td>ned)_LOW</td><td>vel: (low/i</td></t<>		·	/24/2008	ved <u>: 09/2</u>	Date Rec		ned)_LOW	vel: (low/i
7429-90-5 Aluminum 17300 P 7440-36-0 Antimony 6.5 U P 7440-38-2 Arsenic 11.9 P 7440-39-3 Barium -88.8 P 7440-41-7 Beryllium 0.31 JQ P 7440-43-9 Cadmium 2.1 P 7440-70-2 Calcium 2200 E P 7440-47-3 Chromium 18.1 P 7440-48-4 Cobalt 13.4 E P 7430-80-6 Iron 37000 E F P 7439-89-6 Iron 37000 E T P 7439-92-1 Lead 10.0 P F T P 7439-95-4 Magnesium 9510 E T P 7439-97-6 Mercury NR NR P		-	•				.1	Solids: 92
7429-90-5 Aluminum 17300 P 7440-36-0 Antimony 6.5 U P 7440-38-2 Arsenic 11.9 P 7440-39-3 Barium -88.8 P 7440-41-7 Beryllium 0.31 JQ P 7440-43-9 Cadmium 2.1 P 7440-70-2 Calcium 2200 E P 7440-47-3 Chromium 18.1 P 7440-48-4 Cobalt 13.4 E P 7430-80-6 Iron 37000 E F P 7439-89-6 Iron 37000 E T P 7439-92-1 Lead 10.0 P F T P 7439-95-4 Magnesium 9510 E T P 7439-97-6 Mercury NR NR P					/K.G	mg/kg dry weight): N	n Units (ug/L o	ncentratio
7429-90-5 Aluminum 17300 P 7440-36-0 Antimony 6.5. U P 7440-38-2 Arsenic 11.9 P 7440-39-3 Barium -88.8 P 7440-41-7 Beryllium 0.31 JQ P 7440-43-9 Cadmium 2.1 P 7440-70-2 Calcium 2200 E P 7440-47-3 Chromium 18.1 P 7440-48-4 Cobalt 13.4 E P 7440-50-8 Copper 65.2 E P 7439-89-6 Iron 37000 E T P 7439-92-1 Lead 10.0 P P 7439-95-4 Magnesium 9510 E T P 7439-96-5 Manganese 480 E J P 7440-02-0 Nickel 11.8 P P 7440-02-0 Nickel 11.8 P P 7440-02-2 Selenium 3.8 U P		M	0	C	entration	Analyte Co	CAS No.	ŗ
7440-36-0 Antimony 6.5 U P 7440-38-2 Arsenic 11.9 P 7440-39-3 Barium -88.8 P 7440-41-7 Beryllium 0.31 JQ P 7440-43-9 Cadmium 2.1 P 7440-70-2 Calcium 2200 E P 7440-47-3 Chromium 18.1 P 7440-48-4 Cobalt 13.4 E P 7440-48-4 Cobalt 13.4 E P 7439-89-6 Iron 37000 E J-P 7439-89-6 iron 37000 E J-P 7439-92-1 Lead 10.0 P 7439-95-4 Magnesium 9510 E J-P 7439-96-5 Manganese 480 E J-P 7440-02-0 Nickel 11.8 P 7440-09-7 Potassium 527 J@ P 7440-22-4 Silver 0.25 J-TQ NTLe P 7440-22-5 Sodium <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td></td<>								-
7440-38-2 Arsenic 11.9 P 7440-39-3 Barium -88.8 P 7440-41-7 Beryllium 0.31 JQ P 7440-43-9 Cadmium 2.1 P 7440-70-2 Calcium 2200 E P 7440-47-3 Chromium 18.1 P 7440-48-4 Cobalt 13.4 E P 7440-50-8 Copper 65.2 E P 7439-89-6 Iron 37000 E J □ P 7439-92-1 Lead 10.0 P P 7439-95-4 Magnesium 9510 E J □ P 7439-95-5 Manganese 480 E J □ P 7440-02-0 Nickel 11.8 P P 7440-09-7 Potassium 527 JØ P 7440-22-4 Silver 0.25 F Q N P 7440-23-5 Sodium 134 JQ P 7440-22-0 Thallium 2.7				 _				}
7440-39-3 Barium 88.8 P 7440-41-7 Beryllium 0.31 JQ P P P P P P P P P				<u> </u>				
7440-41-7 Beryllium 0.31 JQ P 7440-43-9 Cadmium 2.1 P 7440-70-2 Calcium 2200 E P 7440-47-3 Chromium 18.1 P 7440-48-4 Cobalt 13.4 E P 7440-50-8 Copper 65.2 E P 7439-89-6 Iron 37000 E JL P 7439-92-1 Lead 10.0 P P P 7439-95-4 Magnesium 9510 E JL P 7439-96-5 Manganese 480 E JL P 7439-97-6 Mercury NR 7440-02-0 Nickel 11.8 P 7440-09-7 Potassium 527 JQ P 7782-49-2 Selenium 3.8 U P 7440-22-4 Silver 0.25 F JQ P 7440-23-5 Sodium 134 JQ P 7440-28-0 Thallium 2.7 U			····	- 				. -
7440-43-9 Cadmium 2.1 P 7440-70-2 Calcium 2200 E P 7440-47-3 Chromium 18.1 P 7440-48-4 Cobalt 13.4 E P 7440-50-8 Copper 65.2 E P 7439-89-6 Iron 37000 E JL P 7439-92-1 Lead 10.0 P P P 7439-95-4 Magnesium 9510 E JL P 7439-96-5 Manganese 480 E JL P 7439-97-6 Mercury NR 7440-02-0 Nickel 11.8 P 7440-09-7 Potassium 527 JØ P 7782-49-2 Selenium 3.8 U P 7440-22-4 Silver 0.25 F JQ N 7440-23-5 Sodium 134 JQ P 7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 E JL <				Tio				1-
7440-70-2 Calcium 2200 ₺ P 7440-47-3 Chromium 18.1 ₽ 7440-48-4 Cobalt 13.4 ₺ P 7440-50-8 Copper 65.2 ₺ P 7439-89-6 Iron 37000 ₺ ₺ ₽ 7439-92-1 Lead 10.0 ₽ P 7439-95-4 Magnesium 9510 ₺ ₺ ₽ 7439-96-5 Manganese 480 ₺ ₺ ₽ 7440-02-0 Nickel 11.8 ₽ 7440-02-0 Nickel 11.8 ₽ 7440-09-7 Potassium 527 JQ ₽ 7440-22-4 Silver 0.25 ₺ JQ ₽ 7440-23-5 Sodium 134 JQ ₽ 7440-62-2 Vanadium 83.7 ₽ 7440-66-6 Zinc 44.9 ₺ ₺ よ 10 ₽ ₽ ₽ ₽ ₽ ₽ ₽ 10 ₽ <				- W				H
T440-47-3 Chromium 18.1 P								<u> </u>
7440-48-4 Cobalt 13.4 Æ P 7440-50-8 Copper 65.2 Æ P 7439-89-6 Iron 37000 Æ JC P 7439-92-1 Lead 10.0 P								-
7440-50-8 Copper 65.2 ₽ P 7439-89-6 Iron 37000 ∃ J □ P 7439-92-1 Lead 10.0 ₽ 7439-95-4 Magnesium 9510 ∃ J □ P 7439-96-5 Manganese 480 ∃ J □ P 7439-97-6 Mercury NR NR 7440-02-0 Nickel 11.8 P 7440-09-7 Potassium 527 JQ P 7782-49-2 Selenium 3.8 U P 7440-22-4 Silver 0.25 J Q N J □ P 7440-23-5 Sodium 134 J Q P 7440-28-0 Thallium 2.7 U P 7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 ∃ J □ P			F					-
7439-89-6 iron 37000 上 丁 P 7439-92-1 Lead 10.0 P 7439-95-4 Magnesium 9510 上 丁 P 7439-96-5 Manganese 480 上 丁 P P 7439-97-6 Mercury NR 7440-02-0 Nickel 11.8 P 7440-09-7 Potassium 527 JQ P 7782-49-2 Selenium 3.8 U P P 7440-22-4 Silver 0.25 上 丁 Q N 丁 P 7440-23-5 Sodium 134 JQ P 7440-28-0 Thallium 2.7 U P 7440-66-6 Zinc 44.9 上 丁 P 7440-66-6 Zinc 44.9 上 丁 P 7440-66-6 Zinc 2.7 JQ P 7440-66-6 Zinc 44.9 上 丁 P 7440-66-6 Zinc 2.7 JQ P 7440-66-6 Zinc 2.7 JQ P 7440-66-6 Zinc 2.7 JQ P 7440-66-6 Zinc 2.7 JQ P 7440-66-6 Zinc 2.7 JQ P 7440-66-6 Zinc 2.7 JQ P 7440-66-6 Zinc 2.7 JQ P 7440-66-6 Zinc 2.7 JQ P 7440-66-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P 7440-7 Zinc 2.7 JQ P								}-
7439-92-1 Lead 10.0 P 7439-95-4 Magnesium 9510 正丁レ P 7439-96-5 Manganese 480 正丁レ P 7439-97-6 Mercury NR 7440-02-0 Nickel 11.8 P 7440-09-7 Potassium 527 JQ P 7782-49-2 Selenium 3.8 U P 7440-22-4 Silver 0.25 子	4			-				
7439-95-4 Magnesium 9510 日本 日本 日本 日本 日本 日本 日本 日								<u> </u>
7439-96-5 Manganese 480 上 丁 P 7439-97-6 Mercury NR 7440-02-0 Nickel 11.8 P 7440-09-7 Potassium 527 J及 P 7782-49-2 Selenium 3.8 U P 7440-22-4 Silver 0.25 子 丁 Q N 丁 P 7440-23-5 Sodium 134 JQ P 7440-28-0 Thallium 2.7 U P 7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 上 丁 P			₽ TL	_				-
7439-97-6 Mercury NR 7440-02-0 Nickel 11.8 P P P P P P P P P				_				<u> </u>
7440-02-0 Nickel 11.8 P 7440-09-7 Potassium 527 JQ P 7782-49-2 Selenium 3.8 U P 7440-22-4 Silver 0.25 J P 7440-23-5 Sodium 134 JQ P 7440-28-0 Thallium 2.7 U P 7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 E F P				-				<u> </u>
7440-09-7 Potassium 527 JQ P 7782-49-2 Selenium 3.8 U P 7440-22-4 Silver 0.25 子 「Q 下 下 P 7440-23-5 Sodium 134 JQ P 7440-28-0 Thallium 2.7 U P 7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 上 丁					11.8			·
7782-49-2 Selenium 3.8 U P 7440-22-4 Silver 0.25 F Q N D P 7440-23-5 Sodium 34 JQ P 7440-28-0 Thallium 2.7 U P 7440-66-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 E D P				JQ				 -
7440-22-4 Silver 0.25 子 マQ か 正 P 7440-23-5 Sodium ウ 134 JQ P 7440-28-0 Thallium 2.7 U P 7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 上 丁 P								
7440-23-5' Sodium 134 JQ P 7440-28-0 Thallium 2.7 U P 7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 E D P			TQ H Ik	F 7				· ·
7440-28-0 Thallium 2.7 U P 7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 E J P								
7440-62-2 Vanadium 83.7 P 7440-66-6 Zinc 44.9 E J P		P			2.7			
7440-66-6 Zinc 44.9 E J P	1	P			83.7		7440-62-2	<u> </u>
57-12-5 Cyanide NR	200	P	+ 56		44.9			
	2000	NR				Cyanide		.
	-							
Ior Before: BROWN Clarity Before: Texture: MEDIUM	THE TONY	DIUM	Texture: <u>ME</u> I			Clarity Befor	BROWN	 lor Before <u>:</u>
lor After: YELLOW Clarity After: Artifacts:	10		Artifacts:	-	<u> </u>	Clarity After:	ELLOW	lor After: <u> </u>

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Name_	СНЕМТЕСН СО	ONSULTING GF	OUP Contract: El	<u> W06047</u>	<u>, </u>	1714	IAA97
Code:	СНЕМ	Case No.: <u>3782</u>			SDG No.	: MJAAB	6
rix: (soi	il/water) SOIL	· · · · · ·	Lab Sar	nple ID <u>:</u>	Z4666-06		_
vel: (low	/med)_LOW		Date Re	ceived <u>: (</u>	9/24/2008		<u>.</u>
Solids <u>: 9</u>	91.8						
ncentrati	on Units (ug/L o	or mg/kg dry wei	ght <u>): MG/KG</u>	<u>.</u>	•		
	CAS No.	Analyte	Concentration	С	Q	М	•
٠.	7429-90-5	Aluminum	19000		- <u> </u>	P	. *
İ	7440-36-0	Antimony	6.5	Ū		_ P	
i	7440-38-2	Arsenic	10.3			P	
	7440-39-3	Barium	99.8			P	•
	7440-41-7	Beryllium	0.27_	ΙQ		P	
.]	7440-43-9		1.8			P	
	7440-70-2		2520		P	P	
[7440-47-3	Chromium	12.3			P	
1	7440-48-4	Cobalt	14.6		E	P	•
Ĺ	7440-50-8	Соррег	51.4		Æ	P	
[7439 - 89-6	Iron	34000		ナゴト	P	
Į	7439-92-1	Lead	5.2	<u> </u>	<u> </u>	P	
Ţ		Magnesium	11100	\	上丁し	P	•
Ļ	7439-96-5	Manganese	514	1	<u>+</u> JL	P	
1	7439-97 - 6		·			NR	
·]	7440-02-0	Nickel	12.1	<u> </u>		P	
	7440-09-7	Potassium	534	JR	<u>.</u>	P	
1	7782-49-2	Selenium	3.8	U		P	22 Oct
	7440-22-4	Silver	0.22	4	JQ# JL	Р	20 00
Ļ	7440-23-5	Sodium	137	JQ		P	•
, ,	7440-28-0	Thallium	2.7	U		Р	
	7440-62-2	Vanadium	79.7			P	
, <u> </u>	7440-66-6	Zinc	45.0		# JL	P	
1	57-12-5	Cyanide		<u> </u>		NR	-
L L				<u> </u>			
· L				<u> </u>	<u></u>		-
r Before	BROWN	Clarit	y Before:		Texture: M	EDIUM	- 18ª
	YELLOW	•	y After:	<u>.</u> .	Artifacts:		\®`
ments:		·				-	
		<u> </u>	·	<u> </u>			

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Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047						M	JAA98
	•	Case No.: <u>378</u>				No.: MJAAE	16
	l/water) SOIL		,		Z4666-07		
•				•			
vel: (low/	med) LOW	 •	Date Re	ceived:	09/24/2008		
Solids <u>: 9</u>	11.77						
301108 <u>. 3</u>	1.7						
ncentratio	on Units (ug/L o	or mg/kg dry wei	ight): MG/KG			•	•
I						 	}
	CAS No.	Analyte	Concentration	С	. Q	M	· .
. [7429-90-5	Aluminum	18200			P	
· [7440-36-0	Antimony	. 6.5	U		P	
	7440-38-2	Arsenic	8.2			P	
Ī	7440-39-3	Barium	91.3	}		P	• .
.]	7440-41-7	Beryllium	0.23	JQ		P	
ļ	7440-43-9	Cadmium	1.7.	1		P	
•	7440-70-2	Calcium	2290	1	Æ	P	
. [7440-47-3	Chromium	13.7	1		P	
• •	7440-48-4		13.9	1	Æ	P	•
1	7440-50-8	Copper	39.6	 			
	7439-89-6	Iron	33000	 	-E ਹ		
F	7439-92-1	Lead	4.1	+-+		P	
·	7439-95-4		10200	 	E J		•
. -		Manganese	457	 		_ P	
F		Mercury		1: 1	<u>_</u>	NR	
<u> </u>	7440-02-0	Nickel	9.8	 		P	
. -	7440-09-7	Potassium	495	JQ		P	
<i>i.</i> ** }	7782-49-2	Selenium	3.8	U		P	
	7440-22-4	Silver	0.22	-j-	JQ H IL		
4		Sodium	190	JQ	<u> </u>	P	2000
· -	7440-28-0	Thallium	2.7	U	 	P	20
. F	7440-62-2	Vanadium	75.3	 ~ 	- ,	- 1 P	
}-	7440-66-6.	Zinc	40.8	├───	<u> </u>		4
<u> </u>	57-12-5	Cyanide	1010	 		NR	
 	J1-12:J	~J minuo		 		- -'\'\-	
}-				 			
Ĺ				LL			<i>ح</i> ب
r Before	: BROWN	_ Clari	ty Before:		Texture:	MEDIUM	
•			•		_		
or After:_	YELLOW	_ Clarii	ty After:		Artifacțs:	 	<u> </u>
ıments:							
шіспе.							
							

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ab Name_C	CHEMTECH CO	ONSULTING GR	OUP Contract: EF	<u> W0604</u>	7	<u>. </u>	
ab Code: _	CHEM	Case No.: <u>3782</u> :	NRAS No.:			AALM :.oN &	B6
latrix: (soi	/water) SOIL		Lab Sar	nple ID <u>:</u>	Z4666-08		*
evel: (low/	med) LOW		Date Re	ceived <u>:</u>	09/24/2008	 -	
Solids <u>: 8</u>	6.6						,
oncentratio	on Units (ug/L o	or mg/kg dry weig	ht <u>): MG/KG</u>	<u></u>			
. [CAS No.	Analyte	Concentration	C	Q	М	7
F	7429-90-5	Aluminum	29300			P	
ľ	7440-36-0		6.8	Ū		P	1
. [7440-38-2		11.9		·	P	7
	7440-39-3	Barium	229			P	7
	7440-41-7	Beryllium	0.72			P	7
Γ	7440-43-9	Cadmium	.2.1	1 2 1		P	The same of the sa
Γ	7440-70-2	Calcium	3350		E	P	· .
. [7440-47-3	Chromium	6.9			P] .
ſ	7440-48-4	Cobalt .	10.8		E	P]
	7440-50-8	Copper	24.3		سيخ	P	
	7439-89-6	Iron	31700			JL_P]
. [7439-92-1	Lead	9.7			P	
	7439-95-4		11600			JL P	<u> </u>
	7439-96-5	Manganese	761	\\	- -	JL P	
	7439-97-6	Mercury				NR	_
L	7440-02-0	Nickel	5.4		·	$\overline{\mathbf{P}}$	
	7440-09-7		10700			P	(1)
	7782-49-2	Selenium	4,0	U	·	P	2000
	7440-22-4	Silver	0.19	+	JQ # ;	P] 2
. L	7440-23-5	Dogram,	226	ĴΩ		P	_
	7440-28-0	Thallium	2.8	U		P	<u> </u>
<u>L</u>	7440-62-2	Vanadium	72.4		 _	P	<u>'</u>
	7440-66-6	Zinc	65.6		壬ュ		
L	57-12-5	Cyanide	i			NR	
					·		
	•		·				
or Before	BROWN	Clarity	Before:		Textu	e: MEDIUM	_ 10.15
			*.				10
or Alter:_	YELLOW	Clarity	After:		Artifac	JIS:	<u>. </u>
nments:				•	•	•	•

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INORGANIC ANALYSIS DATA SHEET Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047							IAAB7
	CHEM_				SDG No.	: МЈААВ	6 ·
	oil/water)_SOIL				Z4666-09		
	_		200 5	p. 123			
/el: (low	v/med <u>) LOW</u>		Date Re	ceived <u>:</u>	09/24/2008		 .
Solids <u>:</u>	84.0		•				
	ion Units (ug/L o	or mg/kg dry wei	ght): MG/KG	·			
	CAS No.	Analyte	Concentration	c	Q	M	
				T		P	-
	7429-90-5		3290	 U		$\frac{P}{P}$	
	7440-36-0 7440-38-2		7.1	 		$\frac{P}{P}$	3
	7440-38-2	Arsenic Barium	99.0			$\frac{P}{P}$	•
•	7440-39-3		0.64	}		$\frac{1}{P}$	
	7440-43-9	Beryllium Cadmium		 -		P	
	7440-70-2	Calcium	1810	-{		- 	,
•	7440-47-3	Chromium	21.3			$\frac{1}{P}$	
	7440-48-4	Cobalt	22.8		<u>*</u>	P	
	7440-50-8	Copper	202	 		P	
Ì	7439-89-6	Iron	49900	}	£JL	P	
	7439-92-1	Lead	16.0	+	<u>ــا ئە. س</u> ــــــــــــــــــــــــــــــــــــ	$\frac{1}{P}$	•
	7439-95-4	Magnesium	758	 -	₽ JL	$\frac{1}{P}$	
	7439-96-5		2210		± JL	P	
	7439-97-6	Mercury		 -		NR	•
ł	7440-02-0	Nickel	31.0	1		$\frac{110}{P}$	3
	7440-09-7	Potassium	823	 		P	·
	7782-49-2	Selenium	· 4.1	Ū		P	DOG E
	7440-22-4	Silver	0.55	-j	JQ N JK	P	000
,	7440-23-5	Sodium 37	58.5	JQ		P	20
a. V	7440-28-0	Thallium	2.9	U		P	
ţ	7440-62-2	Vanadium	69.2	1		P	
	7440-66-6	Zinc	1300		ま ゴレ	P	
Ť	57-12-5	Cyanide		1		NR	
1						 	
			·				
r Before	e: BROWN	Clarit	y Before:		Texture: MI	PDπ IM	The state of the s
	YELLOW		y After:		Artifacts:		_ \0
•	T TULL V VY	CIAITI	y /11(6)		AIMAUG		-
ments:							
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Name (CHEMTECH O	ONSULTING GR	OUP Contract: El	PW06047	7	M.	IAAB8
						No.: MJAAB	ı.C
Code: _	CHEM	Case No.: <u>3782</u>	NRAS NO.;		5DG	No.: IVIJAAB	0
rix: (soi	l/water <u>) SOIL</u>		Lab Sar	nple ID <u>:</u>	Z4666-10	·	_
el: (low/	med) LOW		Date Re	ceived <u>: (</u>	9/24/2008		
olids <u>: 7</u>	4.5		÷				,
centratio	on Units (ug/L o	or mg/kg dry weig	ght): MG/KG	· · · · · · · · · · · · · · · · · · ·			
	CAS No.	Analyte	Concentration		Q	M	<u>.</u>
Ė	7429-90-5	Aluminum	40600	T . T		.P	· ·
}	7440-36-0	Antimony	8.1	U		P	
. }	7440-38-2	Arsenic	1.3	1 0		P	
. }	7440-39-3	Barium	369	++	· -	P	
· }-	7440-41-7	Beryllium	0.62	JQ		P	•
	7440-43-9	Cadmium	2.3	- 35	-, -	P	Angles + =
<u> </u>	7440-70-2	Calcium	17700	1		P	
<u> </u>	7440-47-3	Chromium	48.0	╁╌╌┼		P	
-	7440-48-4	Cobalt	22.8	1	18	P	•
<u> </u>	7440-50-8	Copper	62.8	 		P	
<u> </u>	7439-89-6	Iron	39800	† -	- E 5		•
<u> </u>	7439-92-1	Lead	3.4	 	<u></u>	P	
	7439-95-4	Magnesium	13700		£ 1	L P	•
r	7439-96-5	Manganese	· 874	 -		P	
f	7439-97-6	Мегсшту	· · · · · · · · · · · · · · · · · · ·	 	 	NR	-
<u> </u>	7440-02-0	Nickel	28.1			P	
	7440-09-7	Potassium	678			P	
	7782-49-2	Selenium	4.7	Ū		P	2000
, , , , , , ,	7440-22-4	Silver	0.17	- <u>L</u>	JOH J	P	1000
	7440-23-5	Sodium	242	Ja	- y - , y -	P	. 2
Ι.	7440-28-0	Thallium	3.4	U		P	
	7440-62-2	Vanadium	97.7			P	•
	7440-66-6	Zinc	41.1		士 ゴレ	- P	•
T	57-12-5	Cyanide				NR	
			_				
⊢- Refore	: BROWN	Clority	Before:		Tautos	MEDIUM	- (p')
		•					− _{ເອ} ′ີ
After:_	YELLOW	Clarity	After:		Artifacts	·	- ' .
nents:							

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					dDC N		_
ab Code:	CHEM	Case No.: 378	25 NRAS No.:		SDG No.:	MJAAB	6
latrix: (so	il/water) SOIL		Lab Sar	nple ID <u>: Z</u> 4	4666-13		
evel: (low	/med) LOW_		Date Re	ceived <u>: 09/</u>	/24/2008		
Solids <u>: </u>	12,9						
oncentrati	on Units (ug/L o	or mg/kg dry wei	ght): MG/KG	 -	•		
	CAS No.	Analyte	Concentration	С	Q	М	
•	7429-90-5	Aluminum	15400	T		P	
	7440-36-0		14.0	U		P	
ı	7440-38-2		15.8	1		P	
- '	7440-39-3	Barium	161			P	
	7440-41-7	Beryllium	0.25	JQ		P	•
	7440-43-9		1.4			P	
•	7440-70-2		4580		Ē	P	
	7440-47-3		13.3			P	
(7440-48-4		10.1	JQ	<u> </u>	P	• *
l	7440-50-8		18.8	<u> </u>		P	
}	7439-89-6	Iron	23900		<u> </u>	P	,
	7439-92-1		6.5	1		P	·
. [7439-95-4		4380	 	, ₹ _	P	
į.	7439-96-5		1120	<u> </u>	<u>'₽</u> 5∟	P	•
	7439-97-6			 _ _ _		NR	
	7440-02-0	Nickel	8.5	10		P	
.]	7440-09-7	Potassium	555_	JQ.		P	
	7782-49-2	Selenium	1.3	JQ	 _	P	_
	7440-22-4	Silver	2.3	-U	* UJL	P	
	7440-23-5	Sodium	200 .	JQ .		P	
1	7440-28-0	Thallium	5.8	U	· · · · · · · · · · · · · · · · · · ·	P	20 00
ļ	7440-62-2	Vanadium	51.0	 	 	P	
	7440-66-6	Zinc	61.5	 		P	
}-	57-12-5	Cyanide		 -	;	NR	
			<u> </u>				
or Before	: BROWN	Clarit	y Before:		Texture: ME	DIUM	- DIL
•	YELLOW		y After:		Artifacts:		- \D(3
nments:		•					•
mionia,	.0						

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EFA.	₽.	ΔD	ИГЦ	JF.	1.0	┖

ab Name_	CHEMTECH C	ONSULTING G	ROUP Contract: EP	W0 <u>604</u> '	7	L-	
ab Code:	CHEM	Case No.: <u>378</u>	25 NRAS No.: _		SDG N	o.: MJAAB	5
atrix: (so	il/water <u>) SOIL</u>	 -	Lab Sam	ple ID <u>:</u>	Z4666-12		<u>. </u>
vel; (low	/med <u>) LOW ·</u>	<u> </u>	Date Rec	eived <u>: (</u>	09/24/2008	<u> </u>	<u> </u>
Solids: 4	45.4		•			•	
oncentrati	ion Units (ug/L	or mg/kg dry we	ight <u>): MG/KG</u>				
•	CAS No.	Analyte	Concentration	С	Q	M	•
	7429-90-5	Aluminum	21100	Ī		P	
	7440-36-0	Antimony	13.2	U		P	
ì	7440-38-2	Arsenic	19.2			P	
ļ	7440-39-3	Barium	167			P	•
	7440-41-7	Beryllium	0.36	JQ		P	
1 .	7440-43-9	Cadmium	1.7			P	
	7440-70-2	Calcium	4700		- E-	P	
•	7440-47-3	Chromium	24.9			P	•
. [7440-48-4	Cobalt	15.2		E	P	•
	7440-50-8	Copper	25.5		Ē	P	
	7439-89-6	Iron	33800		去」		
1 -	7439-92-1	Lead	7.2			P	
. [7439-95-4		7870		<u> </u>		•
		Manganese	687.		₽ J1		
	7439- <u>9</u> 7-6	Mercury				NR	
{	7440-02-0	Nickel	24.2			P	, _
		Potassium	888	JQ		P	
[7782-49-2	Selenium	0.93	JQ		P	
, [7440-22-4	Silver	2.2	14-	34 m21		20 DET 1
	7440-23-5	Sodium	220	ĴΦ		P	
	7440-28-0	Thallium	5.5	U		P	
. [7440-62-2	Vanadium	70.5			P	
1	7440-66-6	Zinc	79.6		・サゴー		
. [57-12-5	Cyanide			_ 	NR	
}				-+	 		
Low D - F-	DROVAT		tu Doforou		Texture: N	AEDII II 4	AL TO
	: BROWN		ty Before:		• -		
or After.	YELLOW	Clari	ty After:		Artifacts:_	<u> </u>	-
-					41		e de la companya del companya de la companya del companya de la co
nments:							

9-IN METHOD DETECTION LIMITS (ANNUALLY)

Lab Name CHEMTECH CONSULTING GROUP	Contract: EPW06047				
Lab Code: <u>CHEM</u> Case No.: <u>37825</u>	NRAS No.:	SDG No.: MJAAB6			
Instrument Type: P	Instrument ID: P4	Date: 01/15/2008			
Preparation Method: <u>HS1</u>					
Concentration Units (ug/L or mg/kg): MG/KG		•			

Analyte	Wavelength /Mass	CRQL	MDL
Aluminum	308.20	20	0.69
Antimony	206.80	6	0.41
Arsenic	193.70	I .	0.37
Barium	493.40	20	0.090
Beryllium	234.80	0.5	0.010
Cadmium	. 226.50	0.5	0.040
Calcium	373.60	500	3.3
Chromium	267.70	1	0.080
Cobalt	228.60	5	0.080
Copper	224.70	2.5	0.10
Iron	259.80	10	0.20
Lead	220.30	1	0.25
Magnesium	279.00	500	5.3
Manganese	257.60	1.5	0.17
Mercury		0.1	
Nickel	231.60	4	-0.14
Potassium	766.40	500	4.7
Selenium	196.00	3.5	0.35
Silver	328.00	1	0.090
Sodium	589.50	500	2.4
Thallium	190.80	2.5	0.56
Vanadium	292.40	5	0.12
Zinc	206.20	6	0.070
Cyanide		2.5	
<u> </u>			

Comments:			*					•	•				
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9-IN METHOD DETECTION LIMITS (ANNUALLY)

Lab Name CHEMTECH CO	ONSULTING GROUP	Contract: EPW06047	· -
Lab Code: <u>CHEM</u>	Case No.: <u>37825</u>	NRAS No.:	SDG No.: MJAAB6
Instrument Type: P	. ·	Instrument ID: P4	Date: 01/15/2008
Preparation Method: NP1			
Concentration Units (ug/L o	r mg/kg): <u>UG/L</u>		,

Analyte	Wavelength /Mass	CRQL	MDL
Aluminum	308.20	200	12.4
Antimony	206.80	60	2.3
Arsenic	193.70	10	4.1
Barium	493.40	200	2.6
Beryllium	234.80	5	0.20
Cadmium	226.50	5	0.40
Calcium	373.60	5000	106
Chromium	267.70	10	0.80
Cobalt	228.60	50	1.0
Copper	224.70	25	1.6
Iron	259.80	100	3.6
Lead	220.30	10	4.2
Magnesium	279.00	5000	31.2
Manganese	257.60	15	1.9
Mercury		0.2	
Nickel	231.60	40	2.9
Potassium	766.40	5000	35.9
Selenium	196.00	35	3.9
Silver	328.00	10	0.90
Sodium	589.50	5000	25.1
Thallium	190.80	25	2.2
Vanadium	292.40	50	0.60
Zinc	206.20	60	0.70
Cyanide		_10	
	·		

Comments:				
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12-IN PREPARATION LOG

Lab Name CHEM	TECH CONSULTING GROUP	Contract: EPW06047
DEC 1 THILL CARREST	LEGIT COMBCETTION CHOCK	Contidet. Dr 11 Oct 11

Lab Code: CHEM Case No.: 37825 NRAS No.: SDG No.: MJAAB6

Preparation Method: HS1

	<u> </u>		,
EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	09/29/2008	1.00	100
MJAA84	09/29/2008	1.00	100
MJAA85	09/29/2008	1.00	100
MJAA86	09/29/2008	1.00	100
MJAA87	09/29/2008	. 1.01	100
MJAA95	09/29/2008	1.02	100
MJAA96	09/29/2008	1.01	· 100
MJAA97	09/29/2008	1.00	100
MJAA98	09/29/2008	1.00	100
MJAAB6	09/29/2008	1.02	. 100
MJAAB7	09/29/2008	1.01	100
MJAAB8	09/29/2008	1.00	100
MJAAF7	09/29/2008	1.00	100
MJAAF7D	09/29/2008	1.00	100
MJAAF7S	09/29/2008	1.00	100
MJAAF8	09/29/2008	1.00	. 100
PBS	09/29/2008	1.00	100
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